Health and Safety
Committees
Reference Guide
TOOLS AND MACHINERY
Power tools
Hand tools
Snow blowers
FIRST AID
Canadian Centre for
Occupational Health and Safety
CCOHS

Emergency Information

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Ambulance

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Fire

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Police

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Poison Control Centre

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Doctor

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Company Emergency Phone Number

Prepared by

Canadian Centre for Occupational Health and Safety
Hamilton, Ontario, Canada

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Health and Safety Committees Reference Guide

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Health and Safety Committees Reference Guide

Performance Objectives

This guide will help health and safety committee members to:

1. understand their roles and responsibilities under occupational health and safety legislation;
2. form an effective committee;
3. conduct effective and efficient committee meetings;
4. carry out committee activities as set out in the occupational health and safety legislation;
5. recognize workplace hazards and recommend control measures;
6. respond to workplace concerns;
7. assist the employer in resolving health and safety issues; and
8. contact health and safety resources to find information.

Scope

This guide provides practical guidance for the formation and effective functioning of a health and safety committee. The contents are based on the health and safety legislation of different jurisdictions and the principles of an internal responsibility system. Detailed information on specific workplace hazards can be obtained from the Inquiries Service of the Canadian Centre for Occupational Health and Safety (CCOHS).

Target Audience

This guide is a handy reference for committee members and health and safety representatives. Employees, supervisors, managers, and anyone else committed to maintaining health and safety in the workplace will find this guide useful. For training sessions, this guide will serve as a practical handout. This guide will also serve as a practical reference for the formation and effective functioning of voluntary health and safety committees in workplaces where the law does not require the establishment of a committee.

Summary

A health and safety committee is a joint worker-management team that assists the employer in creating and maintaining a safe workplace. In most Canadian jurisdictions a health and safety committee is mandatory. Even in workplaces where a committee is not required by the law, the benefits of a joint committee in addressing workplace health and safety needs are widely recognized. As a result, there is a trend toward establishing a committee on a voluntary basis even where one is not mandatory.

The health and safety committee is an advisory committee to ensure a healthy and safe workplace and not as a body responsible for enforcing legislation. The committee recommends actions to management who has the authority to make changes to meet goals and objectives. The following list illustrates some important activities of the committee :

- Hold regular meetings (at least as many meetings as required by the law)
- Identify workplace hazards and recommend remedial action(s)
- Respond to employee concerns regarding health and safety
- Assist management in the development and implementation of safe work practices and emergency procedures
- Participate in the development, implementation and monitoring of health and safety policies and programs
- Participate in workplace inspections
- Participate in accident/incident investigations
- Participate in resolving work refusals
- Promote education and training

This guide will assist committee members, managers, and health and safety professionals to establish an efficient and effectively functioning committee.

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Section I

Health and Safety Committee Basic Facts

1. What is a Health and Safety Committee?
2. Responsibilities of the Health and Safety Committee

1. What is a Health and Safety Committee?

A health and safety committee is a joint worker-management team that assists the employer in creating and maintaining a safe workplace. The goal of the committee is to enhance the ability of workers and employers to resolve safety and health concerns reasonably and co-operatively. They should do so on their own with a minimum of government involvement.

The committee may be known by different names such as:

- Industrial Health and Safety Committee,
- Joint Work Site Health and Safety Committee,
- Occupational Health Committee,
- Workplace Safety and Health Committee, or
- Joint Health and Safety Committee.

In this publication we will use the name *committee* to mean any of the above terms.

The underlying philosophy of the joint health and safety committee is the **internal responsibility system** which holds the employer and employees jointly responsible for workplace safety and health.

Internal responsibility system:

- recognizes that persons responsible for getting work done must be responsible for getting it done safely,
- enhances the ability of the workers and their supervisors to resolve their health and safety issues cooperatively,
- promotes safety culture,
- promotes best practices,
- helps develop self reliance, and
- helps ensure compliance through a joint management—worker effort.

In smaller companies with fewer than a specified number of employees, a health and safety representative is generally required. Consult your health and safety legislation for details.

2. Responsibilities of the Health and Safety Committee

The health and safety committee assists the employer to:

- recognize workplace hazards,
- evaluate the risk of accidents, injury and illness,
- develop a program to prevent such accidents, injuries and illnesses,
- implement the program,
- evaluate the effectiveness of the program, and
- recommend changes for continuous improvement.

The health and safety legislation generally specifies the duties of the committee. Specific details of the duties vary from one jurisdiction to another. These duties can be further enhanced by establishing terms of reference for the committee to focus on workplace specific needs.

Accountability

The committee's role is to make recommendations for action to prevent accidents, injuries and illness. The authority for action, and hence the accountability for non-compliance, stays with the employer/management. Establishing a committee does not lessen the employer's accountability for health and safety.

Employers are accountable for the health and safety of employees. Generally, legislation has a *general duty clause* which is a statement of the employer's overall responsibility. Following is an example of the general duty clause:

> **"Take every precaution reasonable in the circumstances for the protection of a worker"**
>
> *Ontario Occupational Health and Safety Act (R.S.O. 1990, c. O.1, Section 25(h))*

Proving that everything reasonable in the circumstances was done to protect the health and safety of employees is known as proof of due diligence. This proof is generally accepted as defense against non-compliance charges.

Immunity

The legislation exempts a health and safety representative or a committee member from liability for damages resulting from any action performed in good faith in the execution of his/her duties. For example, see section 65, Ontario Occupational Health and Safety Act. (R.S.O. 1990, c.0.1, Section, Canada Labour Code Part II section 135.1 (13).

Section II

Establishing a Health and Safety Committee

1. Who is Responsible for Establishing a Committee?
2. Guidelines for Forming a Health and Safety Committee

1. Who is Responsible for Establishing a Committee?

The employer (management) is responsible for establishing a committee(s). In most Canadian jurisdictions, legislation sets guidelines for:

- the organization and structure of the committee,
- meeting frequency, and
- roles and responsibilities of committee members.

Employers establish terms of reference applicable to the formation, structure and functioning of the committee in their workplace. Such terms of reference must ensure:

- compliance with the legislation,
- effectiveness of the committee in meeting workplace-specific needs,
- widest possible employee involvement, and
- provision of resources such as employee time, money, equipment and facilities for the functioning of the committee

Tips for Establishing Terms of Reference for a Health and Safety Committee

☑ STATE senior management's commitment to ensure action on committee recommendations.

DEFINE a term of service for committee members – recommended to be "at least one year in Ontario" and "not more than one year" in Alberta.

ESTABLISH committee member selection procedures.

SPECIFY duties and responsibilities of co-chairpersons.

PROVIDE for appropriate training of committee members.

SEEK the committee's advice on the health and safety process and how it is working.

REQUIRE the committee to make recommendations based on objective evidence such as new information, incident rates, employee health conditions, legislative requirements, etc.

STATE that the role of the committee is to make recommendations to management regarding workplace health and safety concerns.

PROVIDE the committee resources to do their work.

ESTABLISH guidelines for reporting and follow-up procedures.

REVIEW terms of reference periodically and make changes to improve the committee performance when necessary.

ESTABLISH procedures and conditions for dismissal of committee members.

DO NOT HOLD the committee accountable for the workplace health and safety. It is the responsibility of management.

DO NOT USE the committee to enforce safety rules or safe work practices that are the responsibility of the line management

DO NOT USE the committee to provide routine safety services. It is better done by professionals in consultation with the committee.

Is a Committee Required by Law?

In Canada, the establishment of a committee is either mandatory or subject to ministerial decision *(see the table on the following page)*. The number of employees is used as criteria for mandatory committees. Consult the most up-to-date applicable legislation to find out the requirements for your workplace.

In general, a committee is required if the number of employees exceeds a certain number – 20 in most jurisdictions and 10 in some. The appointment of a worker representative is required when the number of employees is less than that needed for a committee but more than a minimum set by the law – 5 in some jurisdictions.

Policy Health and Safety Committee

The federal health and Safety act (Canada Labour Code Part II) requires that every employer who normally employs directly three hundred or more employees, must establish a policy health and safety committee (Canada Labour Code Part II, Sec. 134.1).

HEALTH & SAFETY COMMITTEE ESTABLISHMENT CRITERIA
(as required by OH&S law)

	WHEN DO I NEED ONE?	COMMITTEE SIZE	REPRESENTATION
Canada: Federal	Mandatory—20 or more employees	At least 2	At least half to represent employees
British Columbia	Mandatory—when there are 20 or more employees or when "required by order"	Not less than 4	At least half must be worker representatives
Alberta	As directed by the Minister	At least 3 and not more than 12	At least two employees and and one employer or at least half employees
Saskatchewan	Mandatory—when 10 employees or more	At least 2 and not more than 12	At least half to represent employees
Manitoba	Mandatory—20 or more employees or as designated by Lt Governor	At least 4 and not more than 12	At least half to represent employees

	WHEN DO I NEED ONE?	COMMITTEE SIZE	REPRESENTATION
Ontario	Mandatory – 20 or more employees, when ordered by Minister, or where a designated substance is in use (no minimum number of employees)	At least 2 (fewer than 50 employees); at least 4 (50 or more employees)	At least half to represent employees
Quebec	Mandatory – 20 or more employees and where regulated	At least 4	At least half to represent employees
New Brunswick	Mandatory – 20 or more employees	As agreed upon by employees and employer	Equal Representation
Nova Scotia	Mandatory – 20 or more employees	As agreed upon by employees and employer	At least half to represent employees
P.E.I.	Agreed upon by employees and employers	Not specified	At least half to represent employees

	WHEN DO I NEED ONE?	COMMITTEE SIZE	REPRESENTATION
Newfoundland and Labrador	Mandatory – 10 or more employees	At least 2 and not more than 12	At least half to represent employees
Yukon	Mandatory – 20 or more employees	At least 4 and not more than 12	At least half to represent employees
Northwest Territories & Nunavut	As directed by Chief Safety Officer	Not specified	Equal representation

OH&S LEGISLATION APPLICABLE TO HEALTH AND SAFETY COMMITTEES

Canada

Canada Labour Code, Part II (R.S.C. 1985, C. L-2, Ammended 2000), Policy Committee Sec. 134.1 Workplace Health and Safety Committee Sec. 135

British Columbia

Workers Compensation Act, (R.S.B.C. 1996 as amended), Part 3, Division 4, Sections 125 to 140

Alberta

Occupational Health and Safety Act (R.S.A. 2000, c.O-2), Section 31 and the Joint Work Site Health and Safety Committee Regulations (Alta. Reg. 197/77)

Saskatchewan

Occupational Health and Safety Act, 1993 (S.S. 1993, c.O-1.1) Part III Sections 15 to 22

Manitoba

Workplace Safety and Health Act (R.S.M. 1987, c. W210) Section 40

Ontario

Occupational Health and Safety Act (R.S.O. 1990, c.O.1), Section 9(2)

Quebec (English language legislation)

Act Respecting Occupational Health and Safety (R.S.Q., c. S-2.1) Chapter IV, Section 68 to 86. Regulation respecting health and safety committees (R.R.Q. 1981, c. S-2.1, r. 6.1, O.C. 2025-83)

New Brunswick

Occupational Health and Safety Act (A.N.B. 198? c.O-0.2), Sections 14 to 16

Nova Scotia

Occupational Health and Safety Act (S.N.S. 1996, c. 7), Sections 29 to 32

OSH LEGISLATION APPLICABLE TO HEALTH AND SAFETY COMMITTEES *continued*

Prince Edward Island

Occupational Health and Safety Act (R.S.P.E.I. 1988, c.O-1), Section 19.7

Newfoundland and Labrador

Occupational Health and Safety Act (R.S.N.L. 1990, c. O-3) Section 37 to 40

Yukon Territory

Occupational Health and Safety Act (R.S.Y. 1986, c.123), Section 12 & 13

Northwest Territories

Safety Act (R.S.N.W.T. 1988, c. S-1), Section 7

Nunavat

Safety Act (R.S.N.W.T. 1988, c.S-1), Section 7

2. Guidelines for Forming a Health and Safety Committee

How are Committee Members Appointed?

Typically, management members are appointed by the employer (management) and employee members are selected by employees, except in a unionized workplace, where employee members are selected by the union. If not specified in the legislation, selection is to be made according to the terms of reference developed by your workplace.

The legislation generally states that a committee must:

- be composed of at least one-half worker representatives who have been elected or selected by the employees or their union;
- meet regularly – consult your legislation about the frequency of meetings. Some jurisdictions require committee meetings at least once every three months while others require monthly meetings;
- be co-chaired by a manager and an employee member of the committee.

What is the Management/Employee Member Ratio on the Committee?

Laws typically state that there should *not* be more management members on the committee than employee members, or that equal numbers are required. Most committees have equal numbers of management and worker members.

Equal numbers ensure a "well-balanced committee"

How Many People Should be on a Committee?

The legislation or collective agreement may specify the number of committee members. Too few members may mean that not all of the work force is represented. Too many members may make the committee hard to manage. In deciding the committee size, consider these factors:

- total number of employees
- number of different trades or unions involved
- complexity and hazardous nature of the work
- representatives from all segments of the work force
- knowledge of conditions, processes, practices

Example

Code of Practice for Workplace Health and Safety Committees as published by Manitoba Labour suggests the following formula for selecting worker members:

(i) for less than 50 workers, two worker members;

(ii) 50–100 workers, three worker members;

(iii) for each 100 workers thereafter, one additional worker member until the total is six.

Construction sites or other projects

Where a committee is required on a construction site or other project, the principal contractor co-ordinates the formation of the joint health and safety committee with representation from the various crafts and sub-contractors.

More than one union in the workplace

If a single committee is required, the composition of the committee should reflect the proportion of employees in each union. Other important issues, such as representing the full range of company activities, should also be considered in deciding the committee's composition.

Do Members Need to be Trained or Certified in Health and Safety?

Members should be adequately trained in health and safety in order to contribute fully to all committee activities. In some jurisdictions, safety training or certification is required by law for employer and employee members. Training may cover some or all of the following aspects:

- committee responsibilities/authority
- occupational health and safety law
- hazard recognition and control methods
- job safety analysis
- occupational hygiene
- methods of raising safety awareness
- workplace inspections
- accident investigation
- effective oral communication

Must Members Have Relevant Work Experience?

Legislation does not require specific qualifications of committee member. However, employees with varied work backgrounds and those involved in hazardous and complex operations will usually be able to contribute to the committee activities.

How Long Does a Person Serve on the Committee?

The length of time is often specified in the OH&S legislation and may range from one to three years. Members are eligible for re-election. Each member holds office until his or her successor is selected.

Consider that a shorter term allows more new people to be introduced to the committee and learn about health and safety; and that enthusiasm may fade if the term is too long. No matter how long the term is, a staggered

rotation is suggested so that new members come in while others continue; no more than one half of the committee should be *new* at any given time. It is best if the co-chairperson is not a new committee member

What is the Safety Professional's Role with the Committee?

Safety professionals on staff such as safety engineer, fire marshal, plant nurse, or industrial hygienist might serve as safety coordinators or resource persons available to help the committee. The duties of a qualified coordinator include:

- informing employers and workers of the workplace hazards, and
- ensuring control measures are in place to protect employees against these hazards.

The committee should not be controlled by (or seen as controlled by) the safety coordinator.

The functions of the safety coordinator and the committee are closely intertwined. The terms of reference must clearly define the relationship between the two. It would seem logical that the safety coordinator should attend every committee meeting, but his/her role at these meetings should be that of resource person, advisor, or guest.

Can There Be More Than One Committee at a Workplace?

Depending on the number of employees, the complexity of operations, or the company location(s), it may be appropriate to have more than one committee. In this case, a coordinating central committee with representation from each local committee is recommended. Some very large organizations have a tiered system of committees with a hierarchical reporting arrangement. This structure has the advantage of assuring full representation without too many members on a single committee.

Are Members Compensated for Time Spent on Committee Activities?

A committee member is considered to be at work while he/she is doing the committee work. This includes time allocation to prepare for the meeting, the meeting itself, and any related activities (such as workplace inspections). With shift work, this provision is especially important to ensure full attendance at meetings and that all committee tasks are carried out.

Can Committee Members be Penalized?

It is against the law for any employer, or person acting on behalf of the employer, to take action against an employee for participating in the functions of the committee.

Is There a Need to Post and Maintain Records/Documents of the Meetings?

Minutes of all health and safety committee meetings must be recorded. Some jurisdictions may require the use of specific forms. Some may require that the minutes be forwarded directly to the jurisdiction, while others may state that records must be made available when a government official requests them.

Minutes of meetings should be circulated to all committee members. One copy should be posted in the workplace and the original kept with committee records. The minutes should be circulated and posted promptly after a meeting, and remain posted until superseded by minutes of the next meeting. Consult your health and safety legislation for posting requirements applicable to your workplace.

Certified Committee Members (Ontario)

In Ontario, the Health and Safety Act requires that one worker member and one management member of the committee be certified by the Workplace Safety and Insurance Board (WSIB). Certified committee members have the authority to stop dangerous work.

In order to become certified, committee members must take WSIB approved training. A number of organizations offer certification training. A list of such training is available from the WSIB.

Section III

Making the Committee Effective and Efficient

1. Demonstrating Management Commitment
2. Defining Roles, Responsibilities and Procedures
3. Establishing Procedures and Guidelines for Committee Meetings
4. Measuring the Effectiveness and Efficiency of a Committee

1. Demonstrating Management Commitment

Occupational Health and Safety Policy

A policy is a statement of management's commitment to health and safety. It states the principles and general rules that will serve as guides for action. The OH&S policy should recognize the importance of the health and safety committee. The policy statement can be brief, but it should state:

- management's commitment to protect the safety and health of employees
- the organization's basic health and safety philosophy
- accountability for occupational health and safety programs
- roles and responsibilities of health and safety committees
- the general responsibilities of all employees
- that health and safety shall not be sacrificed for expediency
- the consequences of inadequate performance of health and safety duties

The policy should be:

- stated in clear, unambiguous, and unequivocal terms
- dated and signed by the incumbent Chief Executive Officer
- kept up-to-date
- communicated to each employee
- adhered to in all work activities

The following is an example of an occupational health and safety policy statement:

Sample

ABC COMPANY

January 1, 2000

To All Employees:

At ABC Company, the safety and health of our employees comes first. Management is committed to doing everything possible to prevent injuries and to maintain a healthy environment.

To this end:

1. All supervisors are responsible for ensuring that their employees are trained in approved work procedures to obtain optimal output without accidents and injuries and to ensure that employees follow safe work methods and all related regulations.
2. All personnel are required to support the OSH program and make safety and health a part of their daily routine, and to ensure that they are following safe work methods and relevant regulations.
3. All personnel will be held accountable for implementing this program.
4. All relevant laws and regulations are incorporated in our program as minimum standards.
5. All employees are responsible for working safely and for following the company's safety rules. Contact your supervisor, health and safety committee member or human resources department for further information.

Joe Smith, President
ABC Company

Source: "An OSH Program in Your Work Place". Ottawa: Human Resources Development Canada, 1994.

2. Defining Roles, Responsibilities and Procedures

State Purpose and Objectives

The purpose and objectives of the committee should be declared in the company's safety policy statement. As well, the committee may establish its own mission statement specifying its purpose and goals. It helps to define the committee's duties and responsibilities more specifically than those which are only broadly stated in the health and safety legislation.

The following are examples of committee objectives:

Create and **maintain** active interest in health and safety, and accident prevention.

Recommend effective action about accident causing conditions.

Promote awareness about health and safety issues.

Promote cooperation between management and employees in dealing with health and safety issues.

Help identify problems, evaluate risks, and recommend control measures.

Assist employer in implementation of control measures and evaluation of their effectiveness.

Cooperate with the employer in formulating policy and procedures.

Monitor and **improve** workplace health and safety.

The committee should have only a limited number of objectives in the policy statement; having too many objectives can lead to members having different priorities and spreading their energy in too many directions.

Define Authority

Committees are responsible for a set of activities, and they should have the authority to carry out these activities. Some provincial or federal laws state that committees must have authority to:

- ask the employer to provide information concerning workplace hazards,
- carry out or participate in workplace inspections,
- participate in accident investigations,
- participate in resolving work refusal cases,
- hold regular meetings and
- monitor compliance with regulations.

An employer may grant more authority than the minimum stated in the legislation. Normally such increased authority should not extend to situations where a supervisor's responsibility might be overridden, such as correcting unsafe acts or shutting down an unsafe operation unless imminent danger exists.

Authority of Committee Members

Each member must know the extent of his/her authority when dealing with safety matters. Each committee member should review the written statement of authority and confirm that he/she understands it.

There may be occasions when duties have to be revised. For example: when a lack of authority prevents the committee from carrying out a certain task, or when committee members are perceived as regularly exceeding their authority. If a member is given a revised set of duties and a level of authority, the committee should make sure these do not conflict with the general duties of the committee as a whole.

Define the Scope of the Committee's Role

The health and safety committee has the authority to recommend action. Management has the authority and resources to take an action. Employers, managers and supervisors are responsible for the health and safety of employees and are personally accountable for non-compliance. Having a committee, and perhaps some full-time safety specialists on staff, does not relieve them from this responsibility.

Define Committee Members' Duties

Committee members should work together to identify their specific duties. These items may vary according to type and size of organization, industry, number of safety specialists on staff, accident experience in the firm, and number of committees.

Some duties which are common to all committees include:

- attend all committee meetings
- promote health and safety at all times in their area of work
- act as a sounding board on employees' acceptance of health and safety policy
- receive, consider, and resolve employee health and safety complaints
- provide feedback on employees' suggestions
- promote and monitor compliance with health and safety regulations
- attempt to raise health and safety standards above legal requirements
- investigate and advise on cases of refusal to perform unsafe work
- assist in the training of new employees
- participate in the identification and control of hazards
- participate in assessments and the development of control programs for hazardous substances

- participate in accident investigations and inquiries
- study safety programs of other companies to enhance its own program
- conduct health and safety education programs
- make health and safety recommendations
- carry out audit inspections
- advise on personal protective equipment
- monitor effectiveness of health and safety program
- assist in the development of health and safety rules
- assist in the development of safe work procedures

Define Chairperson's Duties and Authority

The committee co-chairpersons must assume extra responsibilities in addition to the usual member duties. Committees with co-chairperson(s) or alternating chairperson(s) should decide whether these extra responsibilities are shared all the time or taken in turn (in some jurisdictions, the method of chairing meetings is legislated).

The chairperson's extra duties may include:

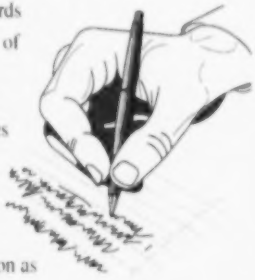
- scheduling meetings and notifying members
- preparing an agenda
- inviting specialists or resource persons as required
- presiding over meetings
- guiding meetings as per agendas
- ensuring all discussion items end with a positive decision
- reviewing and approving the minutes
- assigning projects to members
- ensuring that the committee carries out its function

A list of duties describing the chairperson's (co-chairperson's) responsibilities and authority should be available to all members.

Define the Secretary's Duties

The secretary's additional responsibilities may vary depending on several factors. Where only a single chairperson has been appointed, the secretary may be required to assume that person's duties in his/her absence. The secretary's duties may include:

- keeping pertinent records
- reporting on the status of recommendations
- preparing the minutes
- distributing the minutes after approval
- disseminating safety information to members
- assisting the chairperson as required



Distributing the List of Duties

The duties of health and safety committee members and co-chairpersons should be posted in the workplace, and a copy issued to each committee member. This document may be used as a briefing or training guide for new members, and as an information source for all employees.

Members Must Understand their Duties

Writing a list of duties is not the same as ensuring that each committee member understands what is required of him/her. Members should discuss their list of duties, either one-on-one or as a committee, to make sure each individual understands what is required.

Review of Duties and Structure

The committee should review its responsibilities and duties at set intervals. Sometimes a major change in the organization may necessitate a review of the health and safety committee's responsibilities, duties and structure, and lead to major revisions. In this case, the committee must reorganize itself to fulfill its modified role.

In general, most people are dedicated to safety. Constraints may still be caused by conflicts of interest, conflicts of personality, or pressure from external priorities. The committee should immediately resolve any such issues in order to concentrate on its prime objective—health and safety.

Define Reporting Procedures

The committee reports its recommendations to an individual within management. This person must be fully knowledgeable about the committee duties, and about health and safety issues. It is necessary to appoint a specific person to ensure prompt follow-up on recommendations. The best choice is usually a member of senior management who will likely be able to take action on the recommendations. Staff such as the safety coordinator or personnel department may be in a less favourable position to take direct action.

3. Establishing Procedures and Guidelines for Committee Meetings

The success of the committee depends on the conduct of regular and efficient committee meetings. The following are some tips to establish guidelines for committee meetings:

Meeting Frequency

The OH&S legislation generally specifies how often a committee must meet. Some jurisdictions require monthly meetings whereas others require quarterly (every three months) meetings. A committee which does not meet on a regular basis will lose its drive, and will be perceived by employees and management to be of limited use. Under certain circumstances, such as the initial stages of a newly formed committee or where extraordinary safety problems exist, it may be necessary to meet more often than the legal minimum.

Meeting Attendance Policy

Committees should not settle for just having a quorum at each meeting, but should strive for full attendance. Absenteeism leaves parts of the work force unrepresented, creates discontinuity in committee activities, indicates a lack of commitment to the safety objectives, and reduces the credibility of the committee as a whole. In order to achieve full attendance at meetings, one union alternate and one management alternate should be named.

The committee may invite the health and safety coordinator, occupational health nurse, safety officer or other persons to attend meetings in an advisory or observer capacity.

Meeting Times

Meeting times may depend on factors which are difficult to control. For example, when different shifts have to be represented, a time immediately before or after a shift change might be best. Meetings should not be scheduled for times when many key employees are most needed at their workstation. Whatever time is chosen, it should be the same for each meeting. A routine schedule promotes meeting attendance and emphasizes the importance of health and safety committee activities. People who must attend meetings outside of their scheduled work hours should be compensated for their time.

Postponed Meetings

Once the time and date are set, the meeting should not be postponed except for emergency reasons. Frequently postponed meetings often indicate a lack of interest in safety, a lack of management commitment, and a lack of leadership.

Meeting Location

Meetings should be held in a quiet place with no interruptions. A crowded office, a lunchroom, or work area is not a suitable meeting place. Where available, a meeting room with appropriate training aids such as flip charts, chalk boards, and screens is ideal.

Staying on Schedule

Like all important, well-organized meetings, those of the health and safety committee should start promptly at the designated time. Late starts are another warning sign of a lack of member interest or commitment. On the other hand, since committee members have other duties to perform, meetings should also close at the scheduled time.

Interruptions

The committee should try to avoid any meeting interruptions. No matter how carefully it is planned, any meeting which is frequently interrupted by telephone calls, people popping in to discuss something with individuals, or members being called out of the room, will degenerate into a state of disorganization. Too many interruptions can create a false impression that the meeting is unimportant, and certainly secondary to the normal day-to-day activities in the company.

Meeting Agenda

An agenda serves both as a guide to members' preparation for the organized conduct of the meeting. The following is a sample meeting agenda:

Sample

HEALTH & SAFETY COMMITTEE MEETING AGENDA

1. Roll call (members in attendance)
2. Introduction of visitors
3. Approval of minutes
4. Business arising from the minutes (including progress reports on outstanding items)
5. Reports (inspections, injuries/illnesses, statistics)
6. New business (itemized)
7. Educational session
8. Time, date, place of next meeting
9. Adjournment

Minutes of Previous Meeting (for approval)

New Business Items on the Agenda

All employees (management and non-management) should be encouraged to submit items to their committee representatives. However, since the committee has only a limited time to deal with all health and safety aspects, new business items should be screened before the whole committee addresses them. Priorities might be established based on:

- accident experience,
- workplace inspection reports, and
- introduction of new equipment or procedures.

Agenda items could be approved by the committee as a whole, but here the danger lies in spending too much time on discussing priorities rather than on actual health and safety problems. The decision might best be left to the discretion of the co-chairpersons, or the chairperson and the secretary, as long as both labour and management are represented in the decision.

Agenda Distribution

The agenda should be distributed sufficiently in advance to allow each member to prepare for the meeting. This preparation may involve discussions with the group the member represents, study of health and safety problems noted on the agenda, or other information gathering.

Productive and Efficient Use of Meeting Time

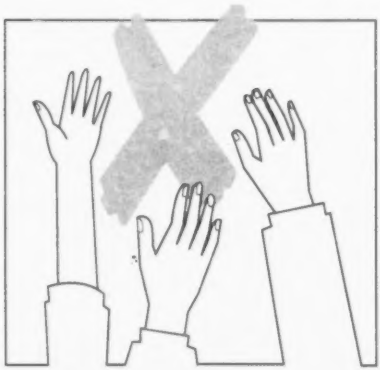
The committee should devote its attention to health and safety matters. The meeting should not be used as a forum for airing general complaints and grievances. Disciplinary and personnel matters should be left for line management, the personnel department, and union staff to handle.

Individual cases of unsafe conditions or acts, such as an employee's failure to wear safety glasses as required, are matters which should be routinely resolved by line management. These items only become an appropriate topic for committee action where an inspection reveals general non-compliance with safety rules and procedures, or when other means to effect corrective action have failed.

Reaching Decisions at Meetings

Whenever possible, decisions should be made by consensus. Formal voting should be avoided if possible because of its inherent *taking sides* nature. No individual should have veto power over the group.

The ideal situation would be that the committee reach a consensus by allowing each person to present arguments and have them debated by all committee members. The committee may reach a compromise by making more than one recommendation, setting priorities, or adopting interim measures. Once general agreement is achieved, support from the entire committee and all employees is more likely to follow.



Formal voting divides the committee because of its *taking sides* nature

Recommendations for Action

The health and safety committee's main function is to make recommendations. Each discussion item at a meeting should end with a specific recommendation for action. Following are helpful tips for making a recommendation:

- state the problem in clear terms based on known facts,
- investigate the problem to find its root cause,
- recommend action(s) to correct the problem.

The problem might be a newly reported hazard, a known hazard which has not been dealt with by line management, or a hazard requiring large expenditures of money to resolve. The health and safety committee should bear in mind that it is trying to sell a recommendation to management, and should therefore present a convincing argument to justify the recommended action.

Any recommendation made by the committee must be logical and practical, and meet all legislative requirements. The committee should specify where the recommended action should take place, and specify a time frame. If a waiting period is expected, an interim solution may be required. One useful way of checking the completeness of a solution is to check that the questions *what? why? where? when?* and *who?* have been answered.

Minutes of Meetings

The minutes of committee meetings serve to keep track of safety problems and to state what recommendations have been made. Minutes also help promote safety to all employees and are a permanent record of health and safety committee activities. Items generally included are:

- time and date of meeting
- who attended
- items discussed (reports, problems, statistics, education)

- reasons for recommendations (and counter-arguments voiced)
- recommendations (specifying action by whom, by when)
- time and date of next meeting

The minutes should be brief and highlight pertinent facts leading to recommendations and decisions. The secretary should take notes during the meeting, using the agenda as a guide, and write the minutes immediately after while the proceedings are fresh in his/her memory. An exact copy of everything said is not required or desired, and the minutes should not be so long that they discourage employees from reading them.

Posting Minutes of the Meeting

Prompt posting of the minutes will show that solutions to health and safety problems have been followed-up without delay. It also indicates that the committee is operating efficiently, and emphasizes that safety is a priority item in the organization. Some jurisdictions require that minutes be forwarded to the employer, to a regulatory agency, or to an organization representing the employees (where applicable).

Keeping Minutes on File

Minutes of previous meetings are useful sources of information, as

- they may show trends,
- they reveal problems requiring further investigation,
- identify new committee members who may need training, and
- identify new training topics.

Minutes should be kept for a minimum of two years, but the total length of time may vary according to the frequency of meetings, and other factors.

Sample

HEALTH AND SAFETY COMMITTEE
—Minutes of Meeting—

Chaired by _____

Date _____ Time _____

Place _____

IN ATTENDANCE

Name	Position and Department	Position in Committee
Joe Smith	Foreman, Welding Shop	Management Co-Chair
Ted Warren	Maintenance Dept.	Employee Co-Chair
Mary Newman	Secretary, H. Resources	Employee Member

ABSENT/REGRETS

RECOMMENDATIONS

Agenda Item #	Decision/ Recommendations	Action by	Completion Date
5. Inspections	Third floor employees report eye strain. It could be due to glare from VDTs.	Personnel Dept.	April 1, 1999

Approved:

Management Co-Chair _____ (signature)

Employee Co-Chair _____ (signature)

4. Measuring the Effectiveness and Efficiency of a Committee

Reduction in injury, illness and accident rates is the most important evidence of the long-term success of a committee. It takes time for such data to accumulate so that we can be sure that an improvement has definitely occurred. An immediate measure of effectiveness is to evaluate how well the committee is carrying out its roles and responsibilities. The following are some of the indicators of an effective committee.

Does Management Fully Support Committee Activities?

Management demonstrates its support of the committee by providing:

- resources the committee needs to function effectively,
- information on potentially hazardous materials/processes,
- reports on health and safety studies and surveys,
- accident, injury, and illness statistics,
- time to carry out safety duties,
- safety reference material,
- necessary monitoring equipment,
- meeting space, and
- periodic health and safety training.

In a Unionized Workplace Does the Union Support the Committee?

A union demonstrates commitment to the committee by:

- having representation on the committee,
- receiving committee reports in their membership meetings,
- educating members on union health and safety policies,

- encouraging union members to attend health and safety seminars,
- helping the committee resolve problems or execute recommendations, and
- encouraging employees to follow policies, procedures and training.

Do Employees Know Who Committee Members Are?

Legislation generally requires that the names of the committee members be posted. This practice is recommended to help employees communicate their concerns effectively. Although each member should take the initiative in making himself/herself known, it helps to:

- post committee members' names and departments on notice boards,
- introduce new employees to the committee during their health and safety orientation training,
- take a leadership role on health and safety matters, and
- have a committee member report at union and management meetings.

Do Employees Know About the Duties and Authority of Members?

The duties and authority of committee members should also be posted. All employees, whether active committee members or not, have a responsibility to participate in the health and safety program.

Do Employees Consider the Committee the Provider of Safety Leadership?

Committee members must be aware of how their actions are viewed by employees. If employees doubt the usefulness of the committee's health and safety function, the committee will see a decrease in employee feedback and cooperation, and may even meet with some opposition. The reverse is usually true for committees with a positive image.

Too often, a committee's failures and setbacks quickly become known while its accomplishments may go relatively unnoticed. Employees should be made aware not only of health and safety problems, but also of any solutions implemented.

Does Management Perceive the Committee as Meeting its Responsibilities?

Even though management is represented on the health and safety committee, other managers might perceive that their individual responsibilities and authority on safety matters have been taken away, resulting in confrontation, or worse still, abandonment of responsibility.

Fortunately, the solution to this problem is relatively simple. The committee's responsibilities and authority should be clearly defined in writing, made known to all, and exercised by committee members. Managers should recognize that:

- health and safety is a legitimate concern of both workers and management, and
- committees play an important role in achieving greater employee participation.

Do Line Supervisors See the Committee as a Communication Barrier Between the Employee and the Supervisor?

The legally recognized communication path for safety matters is between the employee and his/her supervisor.

- Employees report unsafe acts and conditions initially to their immediate supervisor.
- The supervisor is responsible for acting on these reports and directing safe work procedures.
- Committee members should not interfere with this process except under special circumstances such as cases of imminent danger.

Do Employees Perceive the Committee as Reducing Management's Responsibility for Maintaining a Safe Workplace?

In some instances, worker opposition to committees has stemmed from the belief that these committees reduced or removed management's overall responsibility for safety in the workplace. It must be clearly understood by all concerned that management responsibility for safety is in no way diluted or diverted with the formation of a joint health and safety committee.

Are Members Perceived as Enforcers or Advisors?

Individual committee members may alienate employees if they routinely act as enforcers while carrying out their health and safety duties. Ensuring compliance with regulations and procedures is the supervisor's job. The committee member should function as an observer and advisor.

Do Employees Make Suggestions to Members?

Effective two-way communication ensures that employees are aware of committee activities. When employees regularly make suggestions, it indicates that the communication channels are open and working the way they should. To maintain this mutual confidence, the committee should grant a response to any employee who raises a health or safety issue. When follow-up action is delayed, the committee should report to the employee with an explanation.

Does Management Representation on the Committee Reflect Its Commitment to Safety?

Even with best efforts, any program lacking the support of management is likely to fail. One way that management can demonstrate its commitment to safety is through its choice of representatives. A senior manager, preferably from the line organization, can encourage follow-up on recommendations and lend credibility to the committee and its activities. The manager should not dominate the committee, but participate as an equal partner.

Are Members Allowed to Spend Paid Work Hours on Health and Safety Activities?

In some jurisdictions, health and safety legislation specifies a minimum time to be allowed for committee work. Members should be allowed time not only to attend meetings, but to perform all of their safety-related activities.

Are Committee Recommendations Implemented?

If only a small number of the recommendations have been implemented, it may be because of a lack of management commitment to safety, unrealistic recommendations by the committee, or both. Either of these conditions leads to an ineffective committee. The committee can do its part by seeking feasible solutions to problems, and by presenting its recommendations in a comprehensive form.

When a Recommendation is not Implemented, are the Reasons Given to the Committee?

There may be valid reasons why recommendations made by the committee cannot be implemented either immediately or in the long term. A delay might be encountered when new equipment or construction is involved, or when corporate authorization is needed. In any event, after considering a proposal, if management is unable to meet the committee's recommendations, it should give reasons why. Failure to do this promptly can lead to misunderstandings, and the perception that management lacks commitment to safety.

Is the Full Record of Committee Recommendations and Their Status Available to All Employees?

In order to maintain a high degree of safety awareness throughout the workplace, all employees need to be kept informed of all health and safety problems, recommended solutions, the status of their implementation, or reasons for non-implementation. Comprehensive minutes, personal contact with committee members, and reports at union and managment meetings will all help to spread this information. Committee successes need to be publicized, as well as its occasional failures.

Sample

EFFECTIVENESS AND EFFICIENCY CHECKLIST

Yes	No	
		Does management fully support committee activities?
		In a unionized workplace, does the union support the committee?
		Do the employees know who members of the committee are?
		Do employees know about the duties and authority of members?
		Do employees consider the committee useful as a provider of safety leadership?
		Does management perceive the committee as correctly meeting its responsibilities and authority?
		Do line supervisors see the committee as a barrier to employee–supervisor communication in safety?
		Do employees perceive the committee as reducing management s responsibility for maintainig a safe workplace?
		Are members perceived as enforcers or advisors?
		Do employees make suggestions to members?
		Does management representation on the committee reflect its commitment to safety?
		Are members allowed to spend time during paid work hours on health and safety activities?
		When a recommendation is not implemented, are the reasons given to the committee?
		Is the full record of committee recommendations and their status available to all employees?

Section IV

Recognizing Workplace Hazards

1. The Committee's Responsibilities
2. Types of Hazards
3. Methods of Hazard Recognition
4. Hazard Reporting
5. Workplace Inspections

1. The Committee's Responsibilities

Part of the duties of the health and safety committee is to recognize hazards and to make recommendations for improvement. This section will provide a brief overview of situations that can be found in most workplaces. This section is not a comprehensive list of all possible health effects or of all potentially hazardous conditions.

Information on specific workplace hazards can be obtained from the Inquiries Service of the Canadian Centre for Occupational Health and Safety (CCOHS). If you want to know what are the regulations about a specific hazard or those that govern your committee, contact your local government department responsible for health and safety (see Section VIII).

The committee's responsibilities are to:

- be aware of the hazards,
- understand the possible causes of health conditions reported by employees,
- inform employees about potential and actual hazards,
- recommend control measures to management, and
- evaluate the effectiveness of control measures in ensuring a safe workplace without risk of accidents, injuries and harmful exposures.

2. Types of Hazards

What is a Hazard?

A hazard can be defined as the potential in an activity or process which could result in:

- injury to persons,
- damage to equipment, structure or property, or
- degradation of the function of the process.

We know that certain workplace conditions and work practices have the potential to cause accidents, injuries, or risk of illness. Hazard recognition involves identifying these situations for the purpose of taking action to prevent accidents, injuries and illnesses.

Safety is:

(a) freedom from the risk of accident, injury and illness

(b) performing a task in accident-free manner.

The process of hazard recognition involves seeking answers to the following questions:

- Where do accidents and injuries occur?
- How do accidents and injuries occur?
- Why do accidents and injuries occur?

Examples of Workplace Hazards

Certain types of machines and tasks are known to pose a high risk of accidents and injury. These include:

- high energy source
- non-routine work
- non-production work
- maintenance work
- construction work

Certain types of jobs are known to be high risk jobs. Examples of such jobs are:

- electrical work
- work at heights
- material handling
- working near hoisting apparatus and conveyors
- using ropes, chains and slings
- operating powered industrial trucks
- working close to points-of-operation
- working with exhausts and ventilation systems
- woodworking

A "high-risk" situation

- operating machine tools
- welding and cutting
- operating hand-held and portable power tools
- working with chemical(s)
- work in a high noise area
- handling flammable and combustible liquids
- working with boilers and pressure vessels

Investigation of your workplace may uncover a wide range of hazards. Examples are:

SUB-STANDARD WORKPLACE CONDITIONS	SUB-STANDARD WORK PRACTICES
Slippery floors	Not using personal protective equipment
Missing machine guards	Bypassing safety interlocks
Poor workstation design	Running on stairways
Overflowing containers	Ignoring lock-out procedures
Chemical spills	Inadequate job design
Cluttered hallways	Awkward postures
Poor housekeeping	
Poor lighting	

Harmful environmental exposures may not be noticed in a walk-through inspection. However, employees may be exposed to conditions that can cause illness. Such as:

EXAMPLES OF HAZARDOUS CONDITIONS	
Biological Hazards	Mould, fungi, viruses, bacteria, infectious diseases
Toxic Chemicals	Inhalation of dusts, fumes, mists, vapours, and gases; contact with toxic liquids and solids
Physical Agents	Noise, heat, radiation
Poor Indoor Air Quality	Inadequate ventilation, temperature and humidity; toxic air contaminants, moulds, fungi

Methods of Identifying Hazards

The methods of identifying these hazards include:

METHODS OF IDENTIFYING HAZARDS

Method	Example
Anticipation	Inventory of hazardous chemicals, processes
Recognition	Smokes, fumes, vapours, dusts, mists, odours, noise, heat
Evaluation	Exposure measurements
Health Condition(s)	Injury and illness among exposed employees

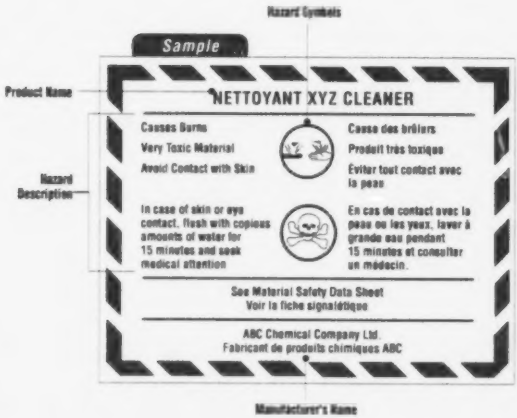
Anticipation

A large amount of information is available through literature on what exposures may result from the use of different machinery, equipment, industrial processes, and chemicals. This knowledge should be used in developing work practices that prevent the risk of harmful exposures.

For example, if toxic chemicals are used in your workplace, prevention measures include:

- compiling an inventory of toxic materials received, handled, produced and disposed,
- making sure that containers have proper WHMIS labels,
- maintaining MSDSs for all controlled products received, handled, produced and disposed,
- implementing safe work practices as recommended in the MSDS,
- ensuring that employees understand emergency procedures,

- providing emergency contact telephone numbers to all employees,
- ensuring employees are trained in the safe use of chemicals, and
- maintaining employee training and employee competency check records


Hazard Symbols
Sample
Product Name
NETTOYANT XYZ CLEANER
Causes Burns
Very Toxic Material
Avoid Contact with Skin
Cause des brûlures
Produit très toxique
Éviter tout contact avec la peau
Hazard Description
In case of skin or eye contact, flush with copious amounts of water for 15 minutes and seek medical attention
En cas de contact avec la peau ou les yeux, laver à grande eau pendant 15 minutes et consulter un médecin.
See Material Safety Data Sheet
Voir la fiche signalétique
ABC Chemical Company Ltd.
Fabricant de produits chimiques ABC
Manufacturer's Name

Recognition

The presence of dusts, smoke, vapours, mists, unpleasant odours, excessive noise, very hot or cold conditions, etc. indicate the possibility of harmful exposures. In order to be sure, these conditions must be evaluated by a qualified professional.

Evaluation

The evaluation of workplace exposure requires specialized technical expertise. The committee must ensure that such measurements:

- are done by a qualified and experienced person,
- are in compliance with the applicable regulations and standards,
- provide results that help evaluate employee exposure and risk of health effects, and
- recommend practical methods of controlling exposures immediately as well as long-term solutions.

Appendix II gives some helpful tips for selecting a consultant.

Health Conditions

Recognizing workplace hazards from existing health conditions is NOT a preferred method of evaluation for the following reasons:

- Health effects may appear many years after the exposure.
- By the time health effects are noticeable, the damage has already occurred.
- All exposed people are not affected equally. In the beginning, only some highly susceptible people report health effects. As exposure continues, more and more people are affected.
- Some types of illnesses can be detected only by medical diagnostic procedures; affected persons do not experience any symptoms until it is too late to find a medical cure.

The following section summarizes health effects of some common occupational exposures.

Types of Health Effects

Health effects due to occupational exposures include:

TYPES OF HEALTH EFFECTS	
Acute Health Effects	Acute health effects are those that occur during the exposure or within hours after exposure. The probability of such effects is typically low at low levels of exposure, but will likely occur above a certain level (threshold level). The severity of such effects increases with exposure level.
Chronic Health Effects	These are illnesses that occur as a result of low-level exposure over many years. Occupational cancers are one of the most serious chronic effects which can occur several years after the original exposure. The period between the exposure and development of disease is known as the latency period. The probability of cancer occurring increases with the level of exposure; however, the severity of the cancer is not affected by the dose.
Teratogenic Effects (Effects on the developing fetus)	Certain exposures may not affect the exposed persons, but can cause developmental abnormalities in the fetus (unborn baby). Known teratogens include certain drugs, infections, alcohol and ionizing radiation.
Genetic Effects	Malformations, abnormalities and diseases can occur in descendants of exposed parents. Ionized radiation is known to cause genetic disorders.

Health Effects Due to Biological Agents

The following table gives examples of diseases that can arise from biological agents:

HEALTH EFFECTS DUE TO BIOLOGICAL AGENTS

Disease	Occupation	Exposure at Risk
Tuberculosis	Health care providers, group home workers	Inhalation of air-borne infection
Farmer's Lung	Agriculture and related jobs	Inhalation of air-borne infection, grain dust, fungus
Q fever	Meat and livestock handlers, slaugher house workers	Airborne or direct contact with carcasses and droppings of infected cattle
Upper Respiratory Tract Infection	Farming, grain handling	Vegetable fibres, cotton, hemp, flax, grain dust
AIDS	Health care providers	Direct contact with infected blood and body fluids
Hepatitis B	Health care providers	Contact with infected blood and biological materials

Health Effects Due to Toxic Chemicals

Most of this information has been discussed in your WHMIS (Workplace Hazardous Materials Information System) training. The following brief summary is to refresh your memory.

Toxic chemicals can enter the body through one or more of the following routes:

METHODS OF ENTRY	
Inhalation	Inhalation is the main route of entry for hazardous chemicals. Airborne dusts, vapours, gases, and mists can be directly inhaled into lungs. Insoluble inhaled materials are deposited into the lungs for long durations of time and can cause lung disease. Soluble inhaled materials can be absorbed and passed into the blood-stream, and the brain.
Ingestion	People can unknowingly eat or drink toxic chemicals such as lead oxide through contaminated foods, drinks and tobacco. These toxic chemicals are absorbed from the digestive system into the blood and then reach the whole body.
Skin	Some chemicals can be absorbed through the skin in quantites that can cause harmful effects. Such compounds include solvents, organic lead compounds, organic phosphate pesticides, phenols, cyanides, toluene, xylene and aromatic amines.

Sites of Action

The toxic action and resulting diseases can occur in the tissues where the toxic chemical is deposited or absorbed.

SITES OF ACTION

Site of Action	Potential Organ or System Affected
Route of Entry	Lungs, skin, digestive system
Circulation in the Body	Blood
Sites of Accumulation	Thyroid, bone, central nervous system
Route of Excretion	Liver, kidney, bladder

Various effects may also be seen at a site of action. For example, skin contact with different agents has different effects:

SKIN CONTACT

Skin Contact with:	Adverse Effect(s)
Acids, Alkalis Irritant Gases Organic Solvents Degreasing Agents	Irritant Dermatitis Skin irritation
Metals Epoxy Resins Formaldehyde	Sensitization Dermatitis Allergic reaction

Health Effects from Physical Agents

The following table summarizes the source of exposure and health effects of selected physical hazards.

SOURCES AND HEALTH EFFECTS OF PHYSICAL HAZARDS

Types	Examples of Source	Health Effects
Noise	Noisy Machines	Hearing Loss, Stress, Annoyance
Hand-arm Vibration	Operation of vibrating hand held tools	White finger, Hand-Arm Vibration Syndrome (HAVS)
Whole-Body Vibration	Working on a vibrating platform, driving farm tractors and other heavy vehicles specially on rough terrain	Back disorders, A wide range of health conditions
Hot Environments	Working near furnaces, Summer outdoor work	Heat stroke, Heat Syncope, (fainting)
Cold Environment	Working outdoors in cold weather, working in cold storage	Hypothermia, Frostbite, Trenchfoot
Hyperbaric (High Pressure) Environments	Diving	Bends/decompression sickness, joint pain, breathing and ear disorders
Hypobaric (Low Pressure) Environments	High altitude workers	Disorders of the lungs, Mountain sickness (headache, nausea, vomiting)

Types	Examples of Source	Health Effects
Ionizing Radiation	Working near x-ray machines, handling radioactive materials, uranium mining, working in nuclear energy power plants, working in nuclear research laboratories	Radiation sickness within hours or days after exposure to very high radiation levels. Cancer after several years of low-level exposure
Non-Ionizing Radiation		
Ultraviolet	Sun light, arc welding, black light lamps, germicidal lamps	Skin cancer, eye damage
Light, Lasers	Lasers, welding, light	Retinal (eye) damage
Microwave and Radio-frequency	Microwave Ovens, radio and TV Transmission, radar Antenna	Heating of the body, central nervous system (CNS) effects
Power Frequency Electro-magnetic Field (ELF)	Working near electric power transmission, distribution lines, or power transformers	Unconfirmed indications of: Leukemia, brain tumors

Health Effects from Poor Indoor Air Quality

Health and comfort effects believed to arise from poor indoor air quality are collectively known as Sick Building Syndrome (SBS). The symptoms generally include headache, fatigue, dry throat, shortness of breath, skin irritation, dizziness, itchy eyes, bleeding nose and general malaise or non-specific illness. Causes of these health effects are varied, but can include:

- air contaminants entering the building
- biological agents such as mold, fungi and substances from plants,
- emissions from furniture, carpets, carpet glues, paints and varnishes,
- tobacco smoke, carbon dioxide, body odours, perfumes,
- toxic gases, vapour fumes, etc. from laboratories, photocopiers and other processes and activities taking place inside the building, and
- indoor environment factors such as temperature, humidity, noise, lighting and air movement.

Health Effects from Inadequate Ergonomic Conditions

Ergonomics is the science of *matching the job to the worker.* The lack of such a match can result in discomfort, pain or injury of the muscles and joints. These injuries are known by many different names, such as:

MSI:	**Musculoskeletal Injuries**
RSI:	**Repetitive Strain Injuries**
RMI:	**Repetitive Motion Injuries**
CTD:	**Cumulative Trauma Disorders**
WMSD:	**Work-related Musculoskeletal Disorders**

The causes of such injuries are:

Job Demands

Posture Awkward postures or prolonged sitting in a fixed position

Force Use of excessive force which overloads muscles and tendons

Repetition Use of the same muscles and joints over and over again while doing a repetitive task.

Workplace Components

Manual Materials Handling Lifting, loading, carrying

Workstation Design Bending, overreaching

Equipment and Tools Vibration, grip force

Work Organization Poor equipment design, too much to do.

Symptoms

Symptoms of WMSD are pain, numbness or tingling, joint stiffness, muscle tightness, and clumsiness or loss of grip. The onset of WMSD is gradual and progressive.

WORK-RELATED MUSCULOSKELETAL DISORDERS

Causes	Symptoms
Repetitive manual tasks	Pain in the hands and wrist
Awkward postures	Pain in the neck, back, and legs
Improper lifting and transferring of loads	Back pain, back injury
Carrying heavy loads, frequently reaching above shoulder level	Pain, weakness and numbness in the shoulders, arms and fingers
Inadequate lighting	Eye strain, headache, pain in the back and neck due to awkward position while performing visual tasks.

3. Methods of Hazard Recognition

Hazard Mapping

Risk mapping or *hazard mapping* is an excellent way to identify hazards and the urgency of controlling these hazards.

All the workers from a shop get together and mark hazard locations on the shop's floor plan. Later, they discuss the importance of controlling these hazards and develop a consensus on which ones should be dealt with first. Following are the strong points of this method:

- Draws on advantages of employee knowledge and experience
- Empowers employees
- Encourages employee involvement
- Effective in many types of workplaces

Job Safety Analysis (JSA)

Job safety analysis (JSA), also known as *job hazard analysis*, is the first step in developing correct work procedures. Job safety analysis involves the following steps:

1. Select a job.
2. Break the job down into a sequence of steps.
3. Identify the hazards of each step.
4. Define preventive measures.

As a first priority, the analysis should be conducted on all critical tasks or jobs:

- those where frequent accidents and injuries occur
- those where severe accidents and injuries occur
- those with a potential for severe injuries
- new or modified jobs
- infrequently performed jobs, such as maintenance

Job safety analysis is generally carried out (often by a trained professional accompanied by a committee member) by observing an employee doing the job. The reason for this exercise must be clearly explained to the employee, emphasizing that the job, not the individual, is being studied. Another approach, useful in the analysis of infrequently-performed or new jobs, is group discussion.

When a job consists of more than one specific task, each task should be analyzed separately in the job safety analysis. The final version should be presented in a narrative format as a step by step procedure to do each task. Reference may be made to applicable rules and regulations and to the personal protective equipment required, if any. Employees who carry out the tasks should be consulted in developing the procedure.

Sample

JOB SAFETY ANALYSIS (JSA) WORKSHEET

Industry: Construction

Operation: Road repair **Job:** Pavement repair

Task	Who does it	Hazards	How to prevent injury/accident
Operating a jack-hammer	Joe Doe	- noise - vibration	- ear protectors - vibration-absorbing gloves

Applicable Legislation: OH&S Act and Regulations (refer to the act and regulations in your jurisdiction)

Date: _____

Developed by: _____

4. Hazard Reporting

Health and safety legislation requires employees to report hazards to their supervisor. This prompts corrective action without waiting for the next round of planned workplace inspection.

Hazards can be reported either verbally, or on a simple form (see example below). Hazard report forms should be readily available to all employees.

Sample

HAZARD REPORTING FORM

Name: .....
Location: .....
Equipment: .....
Date: .....

Description of Hazard: .....

Suggested Corrective Action: .....

Signature: .....

Supervisor's Remarks: .....

Corrective Action Taken: .....

Signature of Supervisor: .....
Date: .....

5. Workplace Inspections

Health and safety committees plan, conduct, report and monitor workplace inspections which are an important part of the overall occupational health and safety program.

Purpose

Inspections allow committee members to:

- hear the concerns of employees and supervisors
- gain further understanding of jobs and tasks
- identify existing and potential hazards
- determine underlying causes of hazards
- monitor hazard controls (personal protective equipment, engineering controls, policies, procedures)
- recommend corrective action

Aspects to Examine

Every inspection must examine the who, what, where, when and how. Pay particular attention to items most likely to develop into unsafe or unhealthy conditions because of stress, wear, impact, vibration, heat, corrosion, chemical reaction, or misuse. Inspect the entire workplace area each time including areas where there is less activity such as parking lots, rest areas, office storage areas, and locker rooms.

Different inspection teams can examine different aspects of the workplace. Teams can divide their areas of responsibility in two ways:

- by location (yard, warehouse, maintenance facility, office, production line), or
- by class of items (tools, buildings, utilities, materials, mobile equipment)

This division results in a separate inspection report from each team based on location or hazard category. Teams should alternate areas of responsibility from month to month.

Workplace Elements

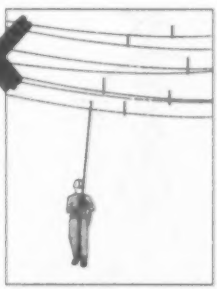
Consider all workplace elements—environment, equipment and process. The environment may present hazards such as noise, vibration, lighting, temperature, and ventilation. Hazardous equipment may include materials, tools and apparatus for producing a product or service. The process, or the way in which the employee works in that environment or with that equipment, also may present hazards.

Hazards to Look For

Look for these types of workplace hazards:

- **Safety Hazards** – inadequate machine guards, unsafe workplace conditions, unsafe work practices
- **Biological Hazards** – organisms such as viruses, bacteria, fungi and parasites
- **Chemical Hazards** – toxic materials used, produced and disposed of; could be solid, liquid, vapour, gas, dust, fume or mist
- **Ergonomic Hazards** – repetitive and forceful movements, vibration, temperature extremes, and awkward postures arising from improper work methods and improperly designed workstations, tools, and equipment
- **Physical Hazards** – noise, vibration, energy, weather, heat, cold, electricity, radiation, pressure

Example of an Ergonomic Hazard



Example of a Physical Hazard

Inspection Schedule

The inspection schedule should state:

- when to inspect each area or item within the workplace
- who carries out the inspection
- to what degree of detail each area or item should be inspected

The number and frequency of inspections depend on the following:

- number and size of different work operations
- type of equipment and work processes – those that are hazardous or potentially hazardous may require more regular inspections
- number of shifts - the activity of each shift may vary
- new processes or machinery
- size and complexity of the work area
- legal requirements for your jurisdiction

Inspections should be conducted as often as the committee meets. Do not conduct an inspection immediately before a committee meeting; try to separate inspections and meetings by at least one week. This time allows for small items to be fixed and gives the committee an opportunity to focus on issues requiring further action.

The Inspection Process

Discuss a plan before undertaking the inspection. Review where inspection team members are going and what they are looking for.

During inspections, wear personal protective equipment (PPE) where required. If you do not have PPE and cannot get any, list this as a deficiency on the inspection report and DO NOT ENTER the area. Re-inspect the area when PPE is provided.

Engineers, maintenance personnel and other specialists should be available to provide information on special equipment or processes. The committee may invite

industrial hygienists, union health and safety specialists, or workplace managers to join the committee inspection team to help examine certain aspects of a work area.

Supervisor involvement

Supervisors are responsible for taking action to prevent accident and injury. Supervisors have an advantage in safety inspections because of their familiarity with employees, equipment and the environment. This familiarity is also a disadvantage because it can interfere with a supervisor's objectivity.

Observation

During the inspection, look for substandard work practices. Use statements such as "an employee was observed operating a machine without a guard."

Substandard work practices may include:

- using machinery or tools without authority
- operating at unsafe speeds or in unsafe manner
- removing guards or other safety devices, or rendering them ineffective
- using defective tools or equipment, or using tools or equipment in unsafe ways
- using hands or body instead of tools or push sticks
- overloading, crowding, or failing to balance materials; or handling materials in unsafe ways (e.g. improper lifting)
- repairing or adjusting equipment that is in motion, under pressure, or electrically charged
- failing to use or maintain personal protective equipment or safety devices, or using them improperly
- creating unsafe, unsanitary, or unhealthy conditions, (e.g., poor house-keeping, smoking in unauthorized areas, or using compressed air to clean clothes)

- standing or working under suspended loads, scaffolds, shafts, or open hatches

These observations must NOT be used as evidence for disciplinary measures against an employee.

Inspection principles

When conducting inspections, follow these basic principles:

☑ DRAW attention to the presence of any immediate danger—other items can await the final report.

ENSURE the shut-down and lock-out of hazardous items that cannot be brought to a safe operating standard until repaired.

LOOK up, down, around *and* inside. Be methodical and thorough. Do not spoil the inspection with a once-over-light approach.

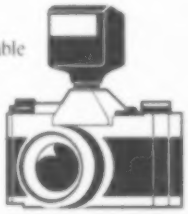
DESCRIBE clearly each hazard and its exact location in your rough notes. Allow on-the-spot recording of all findings before they are forgotten.

ASK questions but do not unnecessarily disrupt work activities.

CONSIDER postponing the inspection if a machine is shut down. Wait until it is functioning again.

DISCUSS as a group, whether you foresee any potential hazard, problem or accident when looking at the equipment, the process or the environment. Determine what corrections or controls are appropriate.

TAKE a photograph if you are unable to clearly describe or sketch a particular situation. Instant developing photographs are especially useful.



DO NOT OPERATE equipment. Ask the operator for a demonstration. If the operator of any piece of equipment does not know what dangers may be present, this is cause for concern.

DO NOT TRY to detect all hazards simply by relying on your senses or by looking at them during the inspection. You may have to monitor levels of exposure to chemicals, noise, radiation or biological agents.

The Inspection Report

On the top of the page, indicate the department or area inspected, the date, and the inspection team's names and titles.

State exactly what has been detected and accurately identify its location; instead of stating *machine unguarded*, state *guard missing on upper pulley #6 lathe in North Building*.

Assign a priority level to the hazards observed to indicate the urgency of the corrective action required. For example:

A = Major—requires immediate action
(do immediately)

B = Serious—requires short-term action
(do within 3 days)

C = Minor—requires long-term action
(do within 2 weeks)

D = Other

After each listed hazard, specify the recommended corrective action and establish a definite correction date. Each inspection team member should review the report for accuracy, clarity and thoroughness.

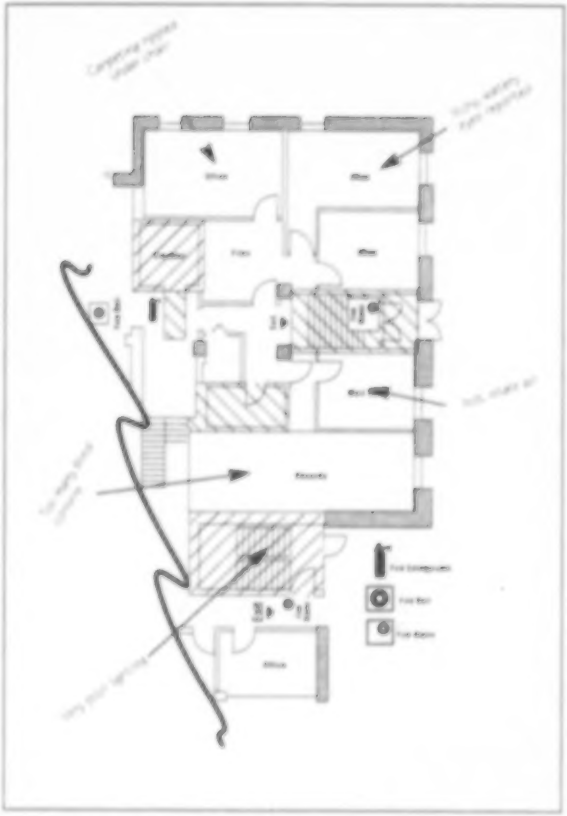
Follow-up and Monitoring

Review the information obtained from regular inspections to identify where immediate corrective action is needed. Identify trends and obtain timely feedback. Analysis of inspection reports may show the following:

- priorities for corrective action
- need for improving safe work practices
- insight about why accidents are occurring in particular areas
- need for training in certain areas
- areas and equipment that require more in-depth hazard analysis

Inspections serve a useful purpose only if remedial action is taken immediately to correct shortcomings. Causes, not symptoms alone, must be rectified.

The health and safety committee should review the progress of the recommendations, especially regarding the education and training of employees. The committee should study the information generated from regular inspections and look for trends. This action helps maintain an effective health and safety program.



A fire escape floorplan is useful for recording information during inspections or while investigating complaints.

Sample

INSPECTION CHECKLIST

Inspector(s) _____

Location/Department _____ Date _____

✔ Satisfactory ✗ Unsatisfactory, requires attention

SAFE WORK PRACTICES

- ❑ Use of machine guards
- ❑ Proper manual lifting
- ❑ Smoking only in safe designated areas
- ❑ Proper use of air hoses
- ❑ No horseplay
- ❑ Other _____

USE OF PPE

- ❑ Eye/face protection
- ❑ Footwear
- ❑ Gloves
- ❑ Protective clothing
- ❑ Head Protection
- ❑ Aprons
- ❑ Respirators
- ❑ Other _____

HOUSEKEEPING

- ❑ Proper storage areas
- ❑ Proper storage of flammable material (oily/greasy rags, etc.)
- ❑ Proper disposal of waste
- ❑ Floors (clean, uncluttered, dry)
- ❑ Maintenance of yards, parking lots
- ❑ Other _____

ELECTRICAL SAFETY

- ❑ Machine grounding/GFI
- ❑ Electrical cords
- ❑ Electrical outlets
- ❑ Other _____

FIRE PROTECTION

- ❑ Fire extinguishers
- ❑ Proper type / location
- ❑ Storage of flammable materials
- ❑ Other _____

TOOLS AND MACHINERY

- ❑ Lawn mowers
- ❑ Power tools
- ❑ Hand tools
- ❑ Snow blowers
- ❑ Machine guards
- ❑ Belts, pulleys, gears, shafts
- ❑ Oiling, cleaning, adjusting
- ❑ Maintenance, oil leakage
- ❑ Other _____

FIRST AID

- ❑ First aid kits in rooms / vehicles
- ❑ Trained first aid providers
- ❑ Emergency numbers posted
- ❑ All injuries reported
- ❑ Other _____

MISCELLANEOUS

- ❑ MSDS*/ Labels
- ❑ Dust / vapour / fume control
- ❑ Safe use of ladders / scaffolds
- ❑ New processes or procedures carried out
- ❑ Other _____

*MSDS=Material Safety Data Sheet

Notes

_____

_____

_____

WORKPLACE INSPECTION REPORT

Sample

Location: _____ Department/Areas covered: _____

Date of Inspection: _____ Time of Inspection: _____

Copies to: _____ Inspected by: _____

Item (Location)	Hazards Observed	Repeat Item Yes/No	Priority A / B / C	Recommended Action	Responsible Person	Action Taken	Date

Analysis and comments:

Priority Codes: A = do immediately B = do within 3 days C = do within 2 weeks D = other

Inspection Checklists—General Information

What should be included on the checklist?

The best checklist for your workplace is one that has been developed for your specific needs. The following are examples of items to be included in a checklist.

CHECKLIST CRITERIA	
Environment	dust, gases, fumes, sprays, lighting, noise, ventilation
Buildings	windows, doors, floors, stairs, roofs, walls, elevators
Containers	scrap bins, disposal receptacles, barrels, carboys, gas cylinders, solvent cans
Electrical	switches, cables, outlets, connectors, grounding, connections, breakers
Fire Protection Equipment	extinguishers, hoses, hydrants, sprinkler alarm systems, access to equipment
Hand Tools	wrenches, screwdrivers, power tools, explosive actuated tools
Hazardous Materials	flammable, explosive, acidic, caustic, toxic
Materials Handling	conveyors, cranes, hoists, hoppers
Personal Protective Equipment	hard hats, safety glasses, respirators, gas masks
Pressurized Equipment	boilers, vats, tanks, piping, hoses, couplings, valves

CHECKLIST CRITERIA *continued*	
Production Equipment	mills, shapers, cutters, borers, presses, lathes
Personnel Support Equipment	ladders, scaffolds, platforms, catwalks, staging
Powered Equipment	engines, electrical motors, compressor equipment
Storage Facilities	racks, bins, shelves, cabinets, closets, yards, floors
Walkways and Roadways	aisles, ramps, docks, vehicle ways
Protective Guards	gear covers, pulleys, belt screens, workstation, guards, railings, drives, chains
Safety Devices	valves, emergency switches, cutoffs, warning systems, limit switches, mirrors, sirens, signs
Controls	start-up switches, steering mechanisms, speed controls, manipulating controls
Lifting Components	handles, eye-bolts, lifting lugs, hooks, chains, ropes, slings
Hygiene and First Aid Facilities	drinking fountains, washrooms, safety showers, eyewash fountains, first aid supplies

Inspection Checklists—Offices

The examples outlined below do not list all the possible items for office inspections. The best checklist for your workplace is one that has been developed for your specific needs. Whatever the format of the checklist, provide space for the inspectors' signatures and the date.

Sample

OFFICE INSPECTION CHECKLIST

Date

Inspectors

✓ Satisfactory ✗ Requires Action

	Location	Condition	Comments
BULLETIN BOARDS AND SIGNS			
Clean and readable			
Material changed frequently			
FLOORS			
Free from loose material debris, worn carpeting			
Free from slippery, oily or wet spots			
STAIRWAYS AND AISLES			
Clear and unblocked			
Stairways well lit			
Handrails, handholds in place			
Aisles marked and visible			
Guards, screens and sound-dampening devices in place and effective			
Filing cabinets, cupboards stable and properly secured			
Properly designed office equipment			
Desks and cabinets free from sharp edges			

	✔ Satisfactory		✗ Requires Action
	Location	Condition	Comments
EMERGENCY EQUIPMENT			
Fire control equipment regularly tested			
Fire control equipment appropriate for the type of fire it must control			
Emergency lighting in place and regularly tested			
Buildings conform to standards with respect to use, occupancy, building services, and plumbing facilities			
Check the following structures to ensure safety			
- swinging doors			
- floor and wall openings			
- ladders, stairways and ramps			
- guardrails			
Are materials stored safely?			
WORKSTATIONS			
Sufficient work surface			
Easy access to telephones and accessories			
Adjustable height			
Chair with adjustable height, armrest, backrest			
Foot rest needed and provided			
Document holder provided			
Standing workstation with adjustable height			
Suitable seating for standing workstations			

	✓ Satisfactory		✗ Requires Action
	Location	Condition	Comments
OFFICE LAYOUT			
Sufficient space for office equipment			
Adequate aisles and walk ways			
Sufficient circulation space around work station			
No proximity to photocopier or heavy traffic areas			
INDOOR AIR QUALITY			
Ventilation system adequately controls smoke, fumes and odours, stuffiness			
Air inlets and outlets free of contaminations such as dusts, molds, smoke, dirt			
Humidity at acceptable level			
Ask people how they feel: dizziness, excessive tiredness, nausea, sore throats, irritated eyes, etc			
Thermal comfort: not too hot, not too cold			
TOXIC SUBSTANCES			
Inventory of all potentially toxic substances in workplace			
Do workers have knowledge of: - adverse health effects			
- exposure levels for employees			
- correct handling methods			
- substitutes for toxic substances where possible			
All toxic substances properly labeled and MSDSs available			

	✔ Satisfactory		✗ Requires Action
	Location	Condition	Comments
SANITATION			
Washrooms and food preparation areas clean			
Are the following provided adequately?			
- toilets			
- showers			
- portable water			
- clothing storage			
- change rooms			
- field accommodations			
- lunchrooms			
Measures in place to prevent the spread of disease			
SECURITY			
Entry and exit procedures at night communicated to all employees for personal security			
Emergency (evacuation, fire, bomb threat) procedures understood by all employees			
LIGHTING			
Lamp reflectors clean with no missing bulbs			
Work surfaces free from glare and shadows			
Adequate window shades provided to control natural light			
Visual comfort: no complaints of eye strain or eye irritation			
Floors free of dark areas			

	✔ Satisfactory		✗ Requires Action
	Location	Condition	Comments
NOISE			
Annoying noise absent			
People are able to talk at 1 meter distance without raising their voice			
MATERIAL STORAGE			
Materials neatly and safely piled			
Passageways and work areas clear of obstructions			
GENERAL			
Extension cords used properly and safely			
Walking areas free from electrical or telephone cords			
All machines properly guarded			
Electrical wiring properly concealed			
All equipment free from sharp metal projections			
All wall and ceiling fixtures fastened securely			
All paper and waste properly disposed of			
Desk and file drawers kept closed when not in use			
Office accessories in secure places			
Are materials stacked on desks or cabinets?			
Are file cabinet drawers overloaded?			
Filing stools or waste-baskets placed where they might be tripping hazards			

Inspection Checklists—Manufacturing Facilities

The examples outlined below do not list all the possible items for manufacturing facilities. The best checklist for your workplace is one that has been developed for your specific needs. Whatever the format of the checklist, provide space for the inspectors' signatures and the date.

Sample

MANUFACTURING INSPECTION CHECKLIST

Date	✓ Satisfactory ✗ Requires Action		
Inspectors	Location	Condition	Comments
ENVIRONMENT			
Are resources available to deal with very hot or very cold conditions (drinking water, lined gloves, insulated boots)?			
Is the rain gear that is provided comfortable, and light enough so as not to constitute a hazard?			
Are work surfaces and grip surfaces safe when wet?			
Do employees know the symptoms of heat cramps, heatstroke?			
WORK PROCESS			
Are repetitive motion tasks properly paced and kept to a minimum?			
Do joint committee members have access to material safety data sheets?			
Are employees informed (by hazard signs and tags)?			
Have all trucks, forklifts and other equipment been inspected and maintained?			

	✔ Satisfactory ✗ Requires Action		
	Location	Condition	Comments
WORK PROCESS *(continued)*			
Are lockout procedures followed?			
Is ventilation equipment working effectively?			
Is the fume and dust collection hood properly adjusted?			
FIRE EMERGENCY PROCEDURES			
Is there a clear fire response plan posted for each work area?			
Do all employees know the plan?			
Are drills held regularly?			
Are fire extinguishers chosen for the type of fire most likely in that area?			
Are there enough extinguishers present to do the job?			
Are extinguisher locations clearly marked?			
Are extinguishers properly mounted and easily accessible?			
Are all extinguishers fully charged and operable?			
Are special purpose extinguishers clearly marked?			
MEANS OF EXIT			
Are there enough exits to allow prompt escape?			
Do employees have easy access to exits?			
Are exits unlocked to allow egress?			
Are exits clearly marked?			
Are exits and exit routes equipped with emergency lighting?			

	✓ Satisfactory ✗ Requires Action		
	Location	Condition	Comments
WAREHOUSE AND SHIPPING			
Are dock platforms, bumpers stairs and steps in good condition?			
Are light fixtures in good condition?			
Are all work areas clean and free of debris?			
Are stored materials properly stacked and spaced?			
Are tools kept in the proper place?			
Are there metal containers for oily rags and for rubbish?			
Are floors free of oil spillage or leakage?			
Is absorbent available for immediate clean-up of spills and leaks?			
Are all Class I products stored in Class I approved buildings or outside the warehouse?			
LOADING/UNLOADING RACKS			
Are steps, railings and retractable ramps on raised platforms in good repair?			
Is piping and in-line equipment in good condition and free of leaks?			
Are loading arms operating satisfactorily?			
Do submerged filling two-stage valves operate properly?			
Are bonding and grounding cables free of breaks?			
Are connections tight and sound?			
Is the general condition of wiring and junction boxes, etc. in good condition (visual inspection)?			

	✓ Satisfactory ✗ Requires Action		
	Location	Condition	Comments
LIGHTING			
Is the level of light adequate for safe and comfortable performance of work?			
Does lighting produce glare on work surfaces, VDT screen and keyboards?			
Is emergency lighting adequate and regularly tested?			
MACHINE GUARDS			
Are all dangerous machine parts adequately guarded?			
Do machine guards meet standards?			
Are lockout procedures followed for maintenance when guards are removed?			
ELECTRICAL			
Is the *Canadian Electrical Code* adhered to in operation, use, repair and maintenance?			
Are all machines properly grounded?			
Are portable hand tools grounded or double insulated?			
Are junction boxes closed?			
Are extension cords out of the aisles?			
Are extension cords being used as permanent wiring?			

	✓ Satisfactory / Requires Action		
	Location	Condition	Comments
TOOLS AND MACHINERY			
Are manufacturers' manuals kept for all tools and machinery?			
Do power tools conform to standards?			
Are tools properly designed for use by employees?			
Are defective tools tagged and removed from service as part of a regular maintenance program?			
Are tools and machinery used so as to avoid electrical hazards?			
Is proper training given in the safe use of tools and machinery?			
CONFINED SPACES			
Are entry and exit procedures available and adequate?			
Are emergency and rescue procedures in place (e.g. trained safety watchers)?			
Is the work area clean and orderly?			
Are floors free from protruding nails, splinters, holes and loose boards?			
Are aisles and passageways kept clear of obstructions?			
Are permanent aisles and passageways clearly marked?			
Are covers or guardrails in place around open pits, tanks and ditches?			

	✓ Satisfactory ✗ Requires Action		
	Location	Condition	Comments
FLOOR AND WALL OPENINGS			
Are ladder-ways and door openings guarded by a railing?			
Do temporary floor openings have standard railings or someone constantly on guard?			
ELEVATING DEVICES			
Are elevating devices used only within capacity?			
Are capacities posted on equipment?			
Are they regularly inspected, tested and maintained?			
Are controls of the *dead man* type?			
Are operators trained?			
NOISE			
Are regular noise surveys conducted?			
Is hearing protection available?			
TEMPORARY WORK STRUCTURES			
Are temporary work structures used only when it is not reasonably practicable to use permanent ones?			
Are excavations properly shored, free of large objects (rocks, etc.) at the edges?			
EMPLOYEE FACILITIES			
Are facilities clean and sanitary?			
Are facilities in good repair?			
Are cafeteria facilities provided away from toxic chemicals?			

	✓ Satisfactory ✗ Requires Action		
	Location	Condition	Comments
MEDICAL AND FIRST AID			
Are there employees trained as first-aid practitioners on each shift worked?			
Are first aid supplies available?			
Are first-aid supplies replenished as they are used?			
PERSONAL PROTECTIVE EQUIPMENT			
Is required equipment provided maintained and used?			
Does equipment meet requirements?			
Is it reliable?			
Is personal protection utilized only when it is not reasonably practicable to eliminate or control the hazardous substance or process?			
Are warning signs prominently displayed in all hazard areas?			
MATERIALS HANDLING AND STORAGE			
Is there safe clearance for all equipment through aisles and doors?			
Is stored material stable and secure?			
Are storage areas free from tipping hazards?			
Are only trained operators allowed to operate forklifts?			
Is charging of electric batteries performed only in designated areas?			

	✓ Satisfactory ✗ Requires Action		
	Location	Condition	Comments
Are dock boards (bridge plates) used when loading or unloading from dock to truck or dock to rail car?			
Are necessary warning devices and signs in use for railway sidings?			
Are specifications posted for maximum loads which are approved for shelving, floors and roofs?			
Are racks and platforms loaded only within the limits of their capacity?			
Are chain hoists, ropes and slings adequate for the loads and marked accordingly?			
Are slings inspected daily before use?			
Are all new, repaired, or reconditioned alloy steel chain slings proof-tested before use?			
Are pallets and skids the correct type and inspected?			
Do personnel use proper lifting techniques?			
Is the size and condition of containers hazardous to employees?			
Are elevators, hoists, conveyors, balers, etc., properly used with appropriate signals and directional warning signs?			

Section V

Accident Investigation

1. What Types of Accidents are to be Investigated?
2. Purpose of Accident Investigation
3. The Accident Investigation Process
4. Determining the Root Cause
5. Recommendations
6. The Written Report

1. What Types of Accidents are to be Investigated

Both accidents and incidents should be investigated.

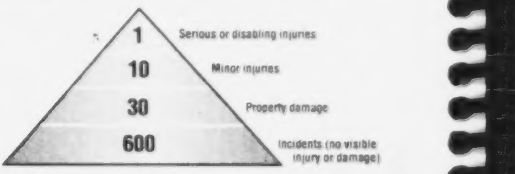
Accident The term *accident* is generally defined as an unplanned event that interrupts the completion of an activity, and that may (or may not) include injury or property damage.

Incident Unplanned events that involve no injury or property damage are called incidents or *near miss*.

All accidents and incidents with potential of injury or property damage must be investigated. These include:

- near miss that could have caused property damage
- accidents that caused property damage but no injury
- accidents that required first aid or minor medical treatment
- near miss with potential for serious injury
- accidents resulting in time loss
- accidents resulting in hospitalization
- accidents resulting in serious injury, amputation, or fatality

Studies have shown that for every serious accident, there are about 600 incidents with no visible injury or damage. These incidents provide us with an opportunity to take corrective action and prevent accidents from happening.



Source: Bird, F.E. et al. Practical Loss Control Leadership. Loganville, Georgia : Institute Publishing, 1989.

2. Purpose of Accident/Incident Investigation

The purpose of the accident investigation is to determine the root cause of the accident and take corrective action to prevent recurrence of similar accidents. Other objectives of accident investigation include:

- to fulfill the legal requirement
- to determine the cost of an accident
- to determine compliance with applicable safety regulations
- to process workers' compensation claims
- to provide proper medical care to accident victims

Accidents involving serious injuries

There are regulatory requirements for the investigation of accidents involving serious injuries. Such injuries are generally defined in the legislation. The following is an example of such a definition. Check OHS Legislation for the exact definition in your jurisdiction:

Example

Critical Injury—Defined

Example: Ontario: Regulation 834 of R.R.O. 1990

For the purposes of the Act and Regulations, "critically injured" means an injury of a serious nature that,

(a) places life in jeopardy;
(b) produces unconsciousness;
(c) results in substantial loss of blood;
(d) involves the fracture of a leg or arm, but not a finger or toe;
(e) involves the amputation of a leg, arm, hand or foot, but not a finger or toe;
(f) consists of burns to a major portion of the body; or
(g) causes the loss of sight in an eye.

Who Investigates?

Ideally, an investigation would be conducted by someone who has expertise in accident causation. If an expert is not available, employees and supervisors with little, if any, previous investigative experience may be called upon to participate in an accident investigation.

Should the Immediate Supervisor be on the Team?

Yes. The supervisor is likely to know most about the work and persons involved and the current conditions. Furthermore, the supervisor can usually take immediate remedial action. The counter argument is that there may be an attempt to gloss over the supervisor's shortcomings in the accident; however, this should not happen if employee representative(s) and management members review all accident investigation reports critically and objectively.

Accident Investigation Policy

An accident investigation policy and procedures are important components of a workplace health and safety program. Committees should assist the employer in developing a policy and the necessary forms for reporting accidents, the investigation, and the follow-up. The following list gives important components of an accident investigation policy.

Be Prepared Before an Accident Occurs

- ☑ HAVE a policy in place
- ASSIGN responsibilities
- DEFINE accident reporting procedures
- DEVELOP forms for investigation and reports
- HAVE procedures for follow-up on recommendations
- IDENTIFY specialists
- UPDATE knowledge and skills regularly

3. The Accident Investigation Process

The accident investigation process involves the following steps:

Process of Accident Investigation

1. Report the accident to a designated person
2. Provide first aid and medical care to the injured persons
3. Evaluate scene
4. Gather physical evidence
5. Preserve evidence
6. Record evidence
7. Gather facts
8. Interview
9. Re-enact
10. Analyze facts
11. Determine cause
12. Recommend corrective action
13. Follow-up on actions taken
14. Evaluate the effectiveness of changes

To Whom Accidents Should Be Reported

The accident investigation policy should define responsibilities and procedures for reporting accidents. Generally the supervisor receives the report and initiates the necessary action.

Provide First Aid and Medical Care to Injured Persons

The most important immediate tasks—rescue operations, medical treatment of the injured, and prevention of further injuries—have priority and must not be interfered with. When these are under control, the investigators can start their work.

Evaluate the Scene and Gather Physical Evidence

As little time as possible should lapse between the moment of an accident (or near miss) and the beginning of the investigation. The tools that members of the investigating team may need (pencil, paper, camera, film, camera flash, tape measure, etc.) should be immediately available so that no time is wasted. It is a good practice to keep an accident investigation kit readily available.

Before anything is moved, you may want to take photographs of the general area and of specific items. Later, careful study of the photographs may reveal conditions or details previously missed. Sketches of the accident scene, based on measurements taken, may also help in subsequent analysis and clarify any written reports. Even if you do take photographs, you should also take notes about the location of broken equipment and debris, and keep samples of materials involved at the accident scene.

Gathering Physical Evidence

☑ OBTAIN sketches and/or photos wherever possible as well as the following details:

- ✔ Positions of Injured Workers
- ✔ Equipment Used
- ✔ Materials Used
- ✔ Safety Devices (Used or "Not Used")
- ✔ Position of Appropriate Guards
- ✔ Position of Machinery Controls
- ✔ Damage to Equipment
- ✔ Housekeeping
- ✔ Weather Conditions
- ✔ Lighting Conditions
- ✔ Noise Levels

Interviewing Eyewitness

Witnesses should be interviewed as soon as possible. If witnesses have an opportunity to discuss the event amongst themselves, individual perceptions may be lost. Witnesses should be interviewed alone rather than in a group.

Interviewing is an art that cannot be given justice in a brief document such as this, but a few do's and don'ts are mentioned below.

☑ PUT the witness, who is probably upset, at ease.

EXPLAIN the reason for the investigation *(to determine cause of the accident and not to assign blame).*

LISTEN and let the witness talk.

CONFIRM that you have accurately recorded the statement.

TRY to sense any underlying feelings of the witness.

TAKE only short notes during the interview.

☒ DO NOT INTIMIDATE the witness.

DO NOT INTERRUPT the witness.

DO NOT PROMPT the witness.

DO NOT ASK leading questions.

DO NOT SHOW your own emotions.

Ask open-ended questions that cannot be answered by simply *yes* or *no*. The questions you ask the witness will naturally vary with each accident, but there are some general questions that should be asked each time:

- Where were you at the time of the accident?
- What were you doing?
- What did you see, hear?
- What were the environmental conditions (weather, light, noise, etc.) at the time?

- What was (were) the injured employee(s) doing at the time?
- In your opinion, what caused the accident?
- How might similar accidents be prevented in the future?

Interview Techniques

- ☑ RELAX!... Remain at ease.
- INTERVIEW in private.
- DISCUSS purpose of investigation.
- SHOW respect and be honest with your purpose.
- ASK for witness version.
- ASK open-ended questions.
- REVIEW story and take notes.
- ASK questions to clarify.
- KEEP witnesses apart.
- CLOSE on a positive note.

Re-enactment of the Accident Scene

Another technique sometimes used to determine the sequence of events is to replay them as they happened. Obviously, great care must be taken so that further injury or damage does not occur. A witness (usually the injured employee) is asked to re-enact in slow motion the actions that preceded the accident.

Re-enactment

- ✔ To be done only when information cannot be obtained any other way.
- ✔ Demonstrate in slow motion with power off.
- ✔ Do not repeat the injury.

4. Determining the Root Cause

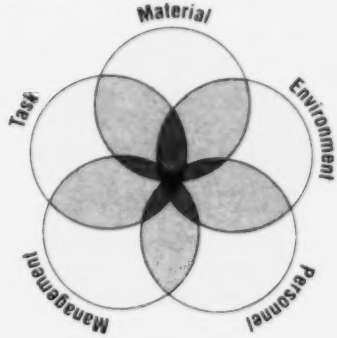
There is seldom, if ever, only a single cause of an accident.

Often we might uncover conditions as causes. It is necessary to determine underlying factors that led to such conditions. For example, an investigation which concludes that an accident was due to *employee carelessness* fails to seek answers to several important questions such as:

- Was the employee distracted? If yes, why was the employee distracted?
- Was a safe work procedure being followed? If not, why not?
- Were safety devices in order? If not, why not?
- Was the employee trained? If not, why not?

Accident Causation

The figure below illustrates the five categories of causes of an accident:



Accident Causation

Each category is examined more closely below. Remember that these are sample questions only. No attempt has been made to develop a comprehensive checklist.

Task

To seek out possible causes resulting from the task(s) being done, seek answers to questions such as:

- Was a safe work procedure used?
- Have conditions changed to make the normal procedure unsafe?
- Were the appropriate tools and materials available?
- Were they used?
- Were safety devices working properly?
- Was lockout used when necessary?

For most of these questions, an important follow-up question is *If not, why not?*

Material

To seek out possible causes resulting from the equipment and materials used, seek answers to the following questions:

- Was there an equipment failure?
- What caused it to fail?
- Was the machinery poorly designed?
- Were hazardous substances involved?
- Were they clearly identified?
- Was a less hazardous alternative substance possible and available?
- Was the raw material substandard in some way?
- Should personal protective equipment (PPE) have been used?
- Was the PPE used?

Again, each time the answer reveals an unsafe condition, the investigator must ask why it was allowed to exist.

Environment

The physical environment at the time of the accident is important not what the *usual* conditions were. For example, accident investigators may want to know:

- What were the weather conditions?
- Was poor housekeeping a problem?
- Was it too hot or too cold?
- Was noise a problem?
- Was there adequate light?
- Were toxic or hazardous gases, dusts, or fumes present?

Personnel

The physical and mental condition of those individuals directly involved in the event must be explored, not to establish blame against someone, but to determine the cause(s) of such condition. Investigators should seek answers to the following questions:

- Were employees experienced in the work being done?
- Had they been adequately trained?
- Were they physically able to do the work?
- What was the status of their health?
- Were they tired?
- Were they under stress (work-related or personal)?

...not to establish blame against someone, but to determine cause(s)...

Management

Management holds the legal responsibility for health and safety in the workplace. Answers to any of the preceding types of questions logically lead to further questions such as:

- Were safety rules communicated to and understood by all employees?
- Were written procedures available?
- Were they being enforced?
- Was there adequate supervision?
- Were employees trained to do the work?
- Had hazards been previously identified?
- Had procedures been developed to overcome them?
- Were unsafe conditions corrected?
- Was equipment regularly maintained?
- Were regular safety inspections carried out?

It should be emphasized that the above sample questions do not make up a complete checklist, but are examples only.

Background information

Useful information can be found in documents such as technical data sheets, maintenance reports, past accident reports, formalized safe-work procedures, and training reports. Any pertinent information should be studied to see what might have happened, and what changes might be recommended to prevent recurrence of similar accidents.

5. Recommendations

Make recommendations designed to prevent similar accidents from happening again. For example, you have determined that a blind corner contributed to an accident. Rather than just recommending *eliminate blind corners* it would be better to suggest:

Install mirrors at the northwest corner of building X (where this accident occurred) and at other blind corners as required throughout the worksite.

NEVER MAKE recommendations about disciplining anyone who may have been at fault. This would not only defeat the real purpose of the investigation, but it would jeopardize the chances for a free flow of information in future accident investigations.

Recommendations

- ✔ be specific
- ✔ be constructive
- ✔ get at root causes
- ✔ identify contributing factors

6. The Written Report

When analysis is complete, jot down a step-by-step account of what happened (your conclusions) working back from the moment of the accident, listing all possible causes at each step. Check each conclusion to determine:

- whether it is supported by evidence, and
- whether the evidence is direct (physical or documentary), based on eyewitness accounts, or based on assumptions.

This account serves as a final check on discrepancies that should be explained or eliminated.

An accident report generally includes the following information:

The Report

- ✔ Name of employee(s)
- ✔ Occupation(s)
- ✔ Nature of injury/damage
- ✔ Location of accident/incident
- ✔ Time of occurence
- ✔ Sketch/photograph of the scene
- ✔ Witnesses
- ✔ Task description
- ✔ Cause of the accident
- ✔ Name of investigator
- ✔ Recommendations

Use your organization's standard form to present your written report. In case your company does not have a standard accident reporting form, the committee may develop one or adopt an existing one. The following are samples of an accident reporting form and an accident investigation form. Modify them to suit your needs.

Sample

ACCIDENT REPORT FORM

Location

Date _____ Time _____

Reported by _____ Department _____

Location of the accident _____

Tasks being performed when accident occurred _____

_____

Injuries

Names of persons affected _____

Nature of injury _____

Possible cause of injury _____

_____

Equipment, tool, substance being used prior to accident _____

_____

_____

_____

Property, Equipment Damage

Damaged items _____

Type of damage _____

How did the damage occur _____

_____

Work Being Done When Accident Occurred

Description of work _____

Names of persons involved _____

Equipment(s) and tools used _____

_____

Details (How accident occurred):

_____

Sketch

Sample

ACCIDENT INVESTIGATION

Investigators Assessment:

How Did The Accident Occur?	Root Cause of Occurrence

Witness Interviews:

Name	How Accident Occurred	Root Cause

Conclusion:

Cause of accident/incident _____

Probability of recurrence _____

Recommendations to Prevent Recurrence:

Action	Responsibility	Finish Date

Investigated by _____

Date _____

Follow-up by _____

Date _____

Recommended actions completed by _____

Date _____

Reports required by Workers' Compensation Board (e.g. WSIB in Ontario)

Accidents involving injuries should be reported to the Worker's Compensation Board on a prescribed form (e.g. WSIB Form 7: Employer's Report of Injury/Disease and WSIB Form 6: Worker's Report of Injury/Disease).

What should be done if the investigation reveals "human error"?

When a thorough worksite accident investigation reveals that some person or persons were apparently at fault (whether management, supervisor or employee), then this fact should be pointed out. The intention here is to remedy the situation, not to discipline an individual.

Failing to point out human failings that contributed to an accident will not only downgrade the quality of the investigation, but will also allow future accidents to happen from similar causes because they have not been addressed.

Follow-up on recommendations

Action on recommendations is the responsibility of the management. The health and safety committee monitors the progress of these actions. Examples of follow-up actions are:

Follow-Up

- ✔ Response to recommendations
- ✔ Time table of corrective actions
- ✔ Condition of injured worker
- ✔ Inform other workers at risk
- ✔ Re-orient worker on return to work

Section VI

Controlling Workplace Hazards

1. Setting Priorities
2. Hazard Control Strategies
3. Hazard Control Practices
4. Fire Prevention
5. First Aid
6. Employee Training
7. Exposure Limits

1. Setting Priorities

The purpose of establishing priorities is to allocate resources for what hazards to control first. Hazard priority is established by taking into account the employee exposure and the potential for accident, injury or illness. The following factors play an important role:

- percentage of workforce exposed
- frequency of exposure
- degree of harm likely to result from the exposure

The following table illustrates a simple method of establishing priority for hazard control. There is no simple formula. Ranking hazards requires the knowledge of the workplace activities, urgency of situations and, most importantly, objective judgement.

HAZARD CONTROL PRIORITY

A Sample Worksheet

Hazard	% Employees Affected	Frequency of Occurrence	Hazard Potential	Priority	Priority Rank
Ergonomics	60	H	H	60-HH	1(?)
Back pain	80	H	H	80-HH	2(?)
Noise	30	L	H	30-LH	3
Heat	50	L	L	50-LL	5
Lasers	2	L	H	2-HL	4

H = high, L = low

2. Hazard Control Strategies

The hazard control strategies are grouped into the following categories according to where the control measure is placed:

- Control at the source
- Control along the path
- Control at the worker
- Administrative controls

Control at the source and *control along the path* are sometimes referred to as engineering controls.

Control at the Source

This is the best control method as it eliminates the hazard from the workplace. Methods of control at the source include:

- addition of safety features to existing machinery
- isolating or enclosing the source
- redesigning the process
- purchasing new equipment
- substituting toxic materials with non-toxic materials
- isolating/enclosing hazardous materials and processes

Control Along The Path

Control along the path involves stopping the hazard before it reaches the employee. Examples of such controls are:

- ventilation
- sound barriers
- radiation shielding
- wet methods for dry, dusty operations

This control method works best when applied close to the source.

Control at the Worker

This method often involves the use of personal protective equipment to minimize or prevent the harm due to workplace hazards. Personal protective equipment should be used as an interim control measure while engineering control methods are being explored.

Simply providing PPE does not guarantee employee safety. In order to ensure the maximum protection possible from this method, employees should be trained in the proper fit, use, maintenance, and test procedures for their PPE.

Personal protective equipment poses an additional burden on the workers. It is restrictive, uncomfortable, and may interfere with the freedom of movement. In some cases, the use of PPE may be harmful to the health of the employee. For example, respirators can cause breathing problems in employees with pre-existing respiratory problems. The use of impermeable suits could cause heat stress problems.

Administrative Controls

Administrative controls are work practices or policies used by employers to minimize worker exposure. Examples of administrative controls include:

- job rotation
- limiting access
- good housekeeping
- reduction of exposure time
- employee education and training
- medical surveillance

3. Hazard Control Practices

Ventilation

The purpose of ventilation is to control air contaminants, temperature and humidity in the work environment and provide *fresh* air. Two kinds of ventilation are used:

Local Exhaust Ventilation

Local exhaust systems trap and remove contaminants near the generating source.

Local ventilation is used when :

- contaminants released are toxic,
- sources of contaminants are localized (released in a small area), and
- direct exposure of employees is possible.

Local exhaust ventilation is typically used for abrasive blasting, grinding, polishing, buffing, spray painting, open solvent baths, and toxic chemical storage areas.

General or Dilution Ventilation

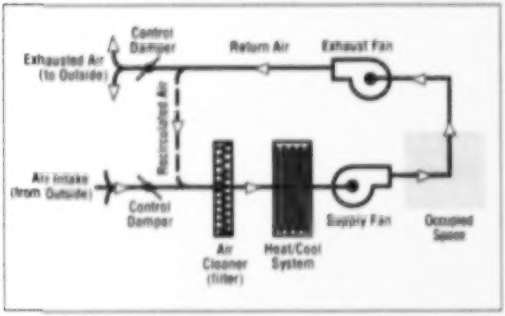
The dilution ventilation removes the contaminated air and brings in outside air to dilute the concentration of airborne contaminants in the work environment.

Dilution ventilation is appropriate when:

- contaminants released are relatively non-toxic,
- quantity of contaminant is not excessive,
- contaminant is released at a substantial distance from the breathing zone of employees, and
- emission sources are widely distributed in the area.

Symptoms of poor ventilation:

- Ventilation system does not conform with the National Building Code, ASHRAE Standard 62* and/or the local Fire or Public Health Regulations.
- Build up of nuisance odours, dusts, gases, vapours, fumes and smoke.
- Significant changes in the workplace design or work activities, without the necessary changes being made to the ventilation to maintain the required level of its effectiveness.
- Blocked air filter units or use of inadequate air filter units.
- Blocked ventilation ducts.



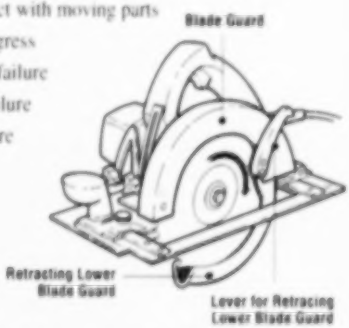
Schematic of Typical Ventilation System

* ***ASHRAE Standard 62***, *"Ventilation for Acceptable Indoor Air Quality"*, published by the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE), is the most widely used standard for ventilation and indoor air quality.

Machine Guarding

Machine guards or barriers are devices fitted on the machinery and equipment to provide protection against:

- Direct contact with moving parts
- Work in progress
- Mechanical failure
- Electrical failure
- Human failure



Machine guards on a circular saw

Machine guards are permanently attached to the machine to protect the operator and any passer-by from coming in contact with the moving parts. Generally there is an interlocking mechanism which prevents the machine from operating if the guard is not in place.

Machine guards must meet the following criteria:

1. Provide positive protection
2. Prevent access to danger
3. Do not cause discomfort or inconvenience
4. Do not interfere with operation
5. Are suitable for the machine/job
6. Have a built-in interlocking feature
7. Allow easy maintenance
8. Are durable
9. Do not constitute another hazard
10. Protect the operator against unforeseen contingencies
11. Conform to applicable safety standards

Lockout Procedures

The purpose of a lockout procedure is to prevent anyone from setting the machine in motion while people are doing maintenance or repair work. Lockout involves:

1. turning switches and locking them in the off position using a lock and key;
2. closing valves on supply lines and locking them;
3. bleeding hydraulic and pneumatic pressure from lines; and
4. lowering the raised loads to the ground to prevent accidental falls.

The committee should identify processes, equipment and machines that require lockout and develop a lockout policy in consultation with the employer and the company safety officer. Such a policy must include:

- lockout procedures for each situation within the company;
- employee and supervisor training;
- provision for periodic updates.

CAUTION: Interlocking mechanisms (switches, etc.) are not substitutes for lockout.

Workplace-Specific Safe Work Practices

The committee should recommend programs to meet specific health and safety needs of their specific workplace. Following are examples of such workplace specific programs:

- Harassment Prevention
- Violence Prevention
- Infection Control
- Noise Control and Hearing Conservation Program
- Asbestos Control
- Confined Space Entry
- Explosive Safety
- Flammable Substances Safety
- Compressed and Liquefied Gas Safety

4. Fire Prevention

Some common starters of fires are sparks, friction, open flames and spilled fuels.

Small fires can be put out using portable fire extinguishers. Anyone who is likely to use a fire extinguisher should be trained in its use. The type of extinguisher to be used depends on the type of fire.

CLASS OF FIRE	TYPE OF FIRE	APPROVED FIRE EXTINGUISHER
	Wood, paper, cloth	Type A Type A-B
	Gasoline, paints, oils, grease	Type A-B Type B-C Type A-B-C
	Electrical, wiring, fuse box	Type B-C Type A-B-C
	Metals	Bucket of Sand

In case of fire, you must follow fire safety procedures as established by your employer.

5. First Aid

First aid regulations may require that employers in all workplaces provide first aid facilities, equipment, and trained personnel with valid first aid certificates. The health and safety committee assists the employer in ensuring that adequate first aid facilities are in place. The contents of first aid boxes must be regularly checked and maintained. For information regarding first aid kits refer to legislation in your jurisdiction. For training, contact the local branch of the St. John Ambulance Association, the Canadian Red Cross Society or any other approved organization.

In case of injury:

1. Promptly obtain first aid.
2. Notify your supervisor/employer.
3. Ask your supervisor for a treatment memorandum to take to a doctor or hospital.
4. Complete and promptly return all forms received from the Workers' Compensation Board.
5. Your supervisor should initiate an accident investigation.

Your employer should post the names and workplace telephone numbers of the people who have agreed to provide first aid at the workplace.

DO NOT MOVE an injured person.

WAIT for a qualified person to administer first aid.

6. Employee Training

Designing a Training Program

Training raises awareness about health and safety policy and safe work practices. In some jurisdictions committee training is mandatory. In Ontario, one worker member and one management member of the committee are required by law to have certification training. Occasions when employee training may be required include:

- commencement of employment
- reassignment or transfer to a new job
- introduction of new equipment, processes, or procedures
- inadequate performance

The following topics should be included in supervisory safety training:

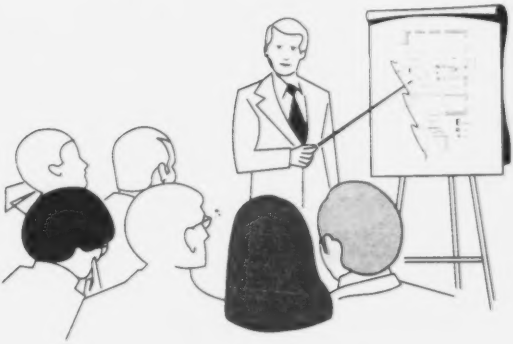
1. safety and the supervisor
2. know your accident problems
3. human relations
4. maintaining interest in safety
5. instructing for safety
6. industrial hygiene
7. personal protective equipment
8. industrial housekeeping
9. material handling and storage
10. guarding machines and mechanisms
11. hand and portable power tools
12. fire protection

The supervisor is generally responsible for much of the training of employees. Training assistance is available from industry associations, unions, government agencies, and consultants.

Conducting Effective Training

When conducting a training session, keep the following in mind:

1. Receive training in how to instruct.
2. Use documented correct work procedures as a training aid.
3. Plan the session beforehand, break the job down into steps, and have training aids available.
4. Explain what is to be done.
5. Explain reasons why each step must be done in a certain way.
6. Describe all the hazards and protective measures.
7. Demonstrate each step, stress key points, and answer any questions.
8. Have the employee carry out each step.
9. Correct errors, and compliment good performance.
10. Check frequently once the employee is working independently to ensure correct performance.



7. Exposure Limits

Exposure limits are the maximum levels to which workers can be exposed. It is advisable to keep the workplace exposure levels as much below the exposure limits as possible.

Exposure limits are specified in the health and safety regulations of each jurisdictions (see following page). In the absence of such regulations, people tend to use the threshold limit values (TLVs) set by the American Conference of Governmental Industrial Hygienists (ACGIH). In general, three types of exposure limits are used.

Time Weighted Average (TWA) Exposure Limit

The TWA sets the average exposure limit for an eight hour working day. Both exposure time and the exposure level are taken into account in determining the TWA. For example, assume that in a work shift the exposure occurred as follows:

TWA EXPOSURE

Exposure Level (ppm)	Exposure Duration (hours)
200	4
100	2
50	1
0	1

$$\text{TWA Exposure} = \frac{(200 \times 4) + (100 \times 2) + (50 \times 1) + (0 \times 1)}{4 + 2 + 1 + 1} = \frac{1050}{8} = 131 \text{ ppm}$$

Short Time Exposure Limit (STEL)

Also referred to as short time exposure value (STEV), is the maximum exposure limit for a period of up to 15 minutes and should not occur more than four times per day. There should be at least 60 minutes between successive exposures to STEL.

Ceiling (TLV-C)

Also referred to as ceiling exposure value (CEV), it should never be exceeded.

Skin

For some chemicals, the exposure limit also has *SKIN* notation. This notation means that contact with the skin, eyes and moist tissues (such as the mouth) can contribute to the overall exposure. Personal protective equipment (such as protective gloves) should be used to prevent absorption through the skin.

Carcinogens

Some chemicals, UV rays and ionizing radiation are known to cause cancer. There is no absolutely safe exposure limit for carcinogens. Any level of exposure poses some risk of cancer. Therefore, exposure to carcinogens must be kept as low as possible below the specified exposure limit.

Exposure Limits for Extended Workshift

For work shifts exceeding an eight hour duration, exposure limits should be reduced to account for increased work time as well as reduced rest time. The Brief and Scala method is recommended by ACGIH in the TLVs booklet:

$$\text{Extended Shift Exposure Limit} = \frac{\text{(8-hour exposure limit)} \times (24 - \text{extended shift hours}) \times 8}{\text{(Extended shift hours)} \times 16}$$

$$\text{Exposure Limit for 12 Hour Shift} = \frac{\text{(8-hour exposure limit)} \times (24 - 12) \times 8}{12 \times 16}$$

$$= 50\% \text{ of 8 hour exposure limit}$$

Sources For Exposure Limits in Canadian Jurisdictions

The following are references to the provincial and federal legislation where you would find the occupational exposure limits. Since legislation is amended from time to time, the jurisdictions should be contacted for the most current information.

Some jurisdictions adopt the ACGIH (American Conference of Governmental Industrial Hygienists) TLVs (Threshold Limit Values) available from:

American Conference of Governmental Industrial Hygienists (ACGIH)
1330 Kemper Meadow Drive
Cincinnati Ohio 45240-1634 USA
Telephone: (513) 742-2020
Fax: (513) 742-3335
Web Site: http://www.acgih.org

Canadian Federal Jurisdiction

The occupational exposure limits that apply to employees covered by Canada Labour Code are the ACGIH TLVs and BEIs for 1994-1995 *as amended from time to time* which are referenced in section 10.19(1)(a) of Canada Occupational Safety and Health Regulations (SOR/86-304 as amended) made under the Canada Labour Code Part II (R.S.C. 1985, c. L-2). Section 10.19(1)(b) specifically sets airborne grain dust exposure limits and Section 10.19(2) states that section 10.19(1) does not apply to concentrations of carbon dioxide or respirable dusts in the underground portions of a coal mine.

The 1986-87 TLVs of the ACGIH have been adopted for the purposes of the following Federal Regulations:

(a) Aviation Occupational Safety and Health Regulations (s. 5.14(1))

(b) Marine Occupational Safety and Health Regulations (s. 8.22(1))

(c) On Board Trains Occupational Safety and Health Regulations (s. 7.20(1))

(d) Oil and Gas Occupational Safety and Health Regulations (s. 11.23(1))

Alberta

Occupational exposure limits for chemical substances (8 hours, 15 minutes, and ceiling values) are listed in Table 1 of Schedule 1 as referred to in section 2(1) of the Chemical Hazards Regulation (Alta.Reg. 393/88) as amended by Alta. Reg. 15/89; 303/92 made under the Occupational Health and Safety Act (R.S.A. 1980, O-2). Table 2 contains occupational exposure limits for dusts and fibres, and Schedule 2 lists substances as referred to in section 9–Codes of Practice, and Section 12– Designated Substances.

British Columbia

Permissible concentrations of airborne contaminant substances (8 hours and 15 minutes limits) are referenced in Table 5-4 of the Occupational Health and Safety Regulations (B.C. Reg. 296/97) made under the Workers' Compensation Act (R.S.B.C. 1979, c. 437).

Manitoba

Occupational exposure limits are referenced in Section 19(2) of the Workplace Health Hazard Regulation (Man. Reg. 53/88, as amended) made under the Workplace Safety and Health Act (R.S.M. 1987, c. W210). The exposure limits are the ACGIH TLVs and BEIs for 1987-88 and are referred to (but not listed) in Schedule C. Section 29 of the same regulation restricts access to designated materials as listed in Schedule B. There is also a requirement under section 19(5) of the Regulation for employers, in some circumstances, to set their own occupational exposure limit to ensure workers are not exposed to health hazards.

New Brunswick

The term *threshold limit value* as defined in section 2 makes specific reference to the 1991-1992 ACGIH TLVs which are referenced (but not listed) in sections 23 and 24 of the General Regulation (N.B. Reg. 91-191) made under the Occupational Health and Safety Act (S.N.B. 1983, c. O-0.2. A Code of Practice for Working with Material Containing Asbestos Regulation is made under the Occupational Health and Safety Act (Reg. 92-106 under the Act).

Newfoundland

The TLVs "currently established by "ACGIH" (i.e. the most recent edition) are referred to (but not listed) in subsection 25(11) of the Occupational Health and Safety Regulations (C.N.R. 1165/96) made under the Occupational Health and Safety Act (R.S.N. 1990, c. O-3).

Northwest Territories

Section 1 of the General Safety Regulations (R.R.N.W.T. 1990, c. S-1) under the Safety Act (R.S.N.W.T. 1988, c. S-1) defines "contaminant" and makes specific reference to the occupational exposure limits as set out in Tables 2 and 3 of Schedule A. There are also specific regulations for silica sandblasting safety and asbestos safety.

Nova Scotia

The ACGIH TLVs for 1976 "and its subsequent amendments or revisions" are referenced (but not listed) in section 4 of the Occupational Health Regulations (N.S. Reg. 112/76) made under the Occupational Health and Safety Act (S.N.S. 1996, c. 7). Codes of Practice exist for asbestos and lead under the Occupational Health and Safety Act.

Nunavut

Exposure limits are set out in Table 1 and 2 of Schedule A of General Safety Regulations R.R.N.W.T 1980.

Ontario

Exposure limits are specifically listed in the Regulation respecting Control of Exposure to Biological or Chemical Agents (Ont.Reg. 833 of RRO 1990 as amended by O.Reg. 513/92, 597/94) under the Occupational Health and Safety Act (R.S.O. 1990, c.O.1).

Exposure limits and certain regulatory requirements regarding some other chemicals are found in the individual Designated Substance regulations made under the Occupational Health and Safety Act.

Prince Edward Island

ACGIH TLVs and BEIs for "1985-86 (with annual update)" are referenced (but not listed) in Sec. 11.3 of the Occupational Health and Safety Act Regulations (E.C. 180/87) made under the Occupational Health and Safety Act (R.S.P.E.I. 1988, c. O-1 as amended).

Quebec

Average concentrations (8-hours) and maximum concentrations (for 15 minutes) are referenced in section 5 and are listed in Schedule A of the Quebec Regulation respecting the quality of the work environment (Règlement sur la qualité du milieu de travail) (R.R.Q. 1981, S-2.1, r. 15) made under the Act Respecting Occupational Health and Safety (R.S.Q. c. S-2.1) (Loi sur la santé et la sécurité du travail et règlements).

Saskatchewan

Sections 307, 309 and 346(f) of the Saskatchewan Occupational Health and Safety Regulations, 1996 under the Occupational Health and Safety Act (S.S. 1993, c. O-1) refer to Table 21 which contains Contamination Limits (8-hour average and 15-minute average contamination limits).

Yukon Territory

Tables 8, 9, 10, 11, and 14 of Occupational Health Regulations (Yukon O.I.C. 1986/164)

Sources of Exposure Limits in the USA

1. OSHA Permissible Exposure Limits (PEL): These are legal exposure limits published and enforced by OSHA (Occupational Safety and Health Administration).
2. ACGIH TLVs : The TLVs published by ACGIH are not legal exposure limits, but are generally used as a guideline to control workplace exposures.
3. Standards: Some ANSI and ASHRAE standards recommend exposure guidelines.

Section VII

Health and Safety Legislation

1. Canadian OH&S Legislation
2. Workplace Hazardous Materials Information System (WHMIS)
3. Material Safety Data Sheets (MSDSs)
4. US OH&S Legislation

1. Canadian OH&S Legislation

The purpose of Occupational Health and Safety (OH&S) legislation is to protect you, the employee, against hazards on the job. It outlines the general rights and responsibilities of the employer, the supervisor and the employee.

The law makes both you and your employer jointly responsible for workplace health and safety legislation.

What Does the OH&S Legislation Say?

Each of the provinces and the federal government have their own OH&S legislation. The details of the OH&S legislation vary slightly from one jurisdiction to another but the basic elements are the same.

Most Canadian jurisdictions have a general duty provision in their OH&S legislation which requires employers to take all reasonable precautions to protect the health and safety of employees.

Government's Responsibilities

Government is responsible for ensuring compliance with health and safety legislation. Responsibilities of government include:

i) to develop and enforce occupational health and safety legislation regarding workplace inspections

ii) to designate safety officers who conduct workplace inspections to ensure compliance with the legislation

iii) to disseminate information

iv) to promote training, education and research

v) to take action in case of noncompliance

Employee's Rights

i) to refuse unsafe work

ii) to participate in workplace health and safety activities through the Joint Health and Safety Committee (JHSC) or an employee health and safety representative

iii) to know actual and potential dangers in the workplace

Employee's Responsibilities

i) to work in compliance with the OH&S act and regulations

ii) to use personal protective equipment and clothing as directed by the employer

iii) to report workplace hazards and dangers

Supervisor's Responsibilities

i) to ensure that employees use prescribed protective equipment

ii) to advise employees of potential and actual hazards

iii) to take every reasonable precaution in the circumstances for the protection of employees

Employer's Responsibilities

i) to establish and maintain a joint health and safety committee, or cause employees to select at least one health and safety representative

ii) to take every reasonable precaution to ensure the workplace is safe

iii) to inform employees about any potential hazards and provide training to work safely

iv) to provide personal protective equipment and ensure workers know how to use the equipment safely and properly

v) to immediately report all critical injuries to the government department responsible for OH&S

vi) to train all employees on how to safely use, handle, store and dispose of hazardous substances and handle emergencies

Joint Health and Safety Committee (JHSC)

i) must be composed of management and employee representatives

ii) at least half the members of the committee must be employee representatives

iii) must meet at least once every 3 months; 1 month in some jurisdictions

iv) must be co-chaired by one management chairperson and one employee chairperson

v) employee representatives are elected or selected by the employees or their union

Role of the Joint Health and Safety Committee

i) to act as an advisory body

ii) to identify hazards and obtain information

iii) to recommend corrective actions

iv) to assist in resolving work refusal cases

v) to participate in accident investigations and workplace inspections

Work Refusals

You can refuse work if you have reason to believe that the situation is unsafe to either yourself or your co-workers.

i) You must report to your supervisor that you are refusing to work and state why you believe the situation is unsafe.

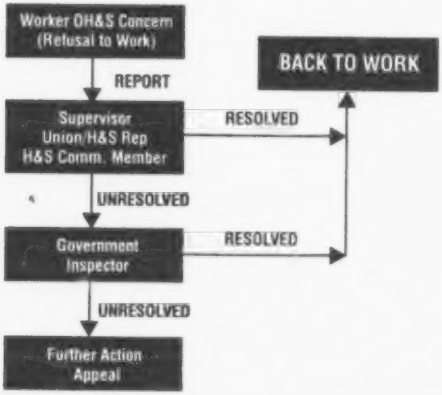
ii) You, your supervisor, and a JHSC member or employee representative will investigate.

iii) You return to work if the problem is resolved.

iv) If the problem is not resolved, a government health and safety representative is called.

v) Your supervisor may assign you reasonable alternative work.

vi) The inspector will investigate the situation and give a decision.



Work Refusal Flow Chart

Work Stoppage

Work stoppage legislation applies to Ontario only. Certified members of the Health and Safety Committee may direct the employer to stop work if all of the following three conditions exist:

i) Health and safety legislation is being violated.

ii) The violation poses a danger or a hazard to employees.

iii) Any delay in controlling the danger or hazard may seriously endanger an employee.

Ask your Health and Safety Committee for detailed procedures for work stoppage.

2. Workplace Hazardous Materials Information System (WHMIS)

What is WHMIS?

WHMIS is a comprehensive plan for providing information on the safe use of hazardous materials in Canadian workplaces. This information is provided by means of:

1. product labels,
2. product classification,
3. material safety data sheets (MSDS), and
4. employee education programs.

What are Controlled Products?

Controlled products is the name given to products, materials, and substances that are regulated by WHMIS legislation. All controlled products fall into one or more of six WHMIS classes.

Is WHMIS a Law?

Yes. WHMIS became law through a series of complementary federal, provincial and territorial legislation that became effective October 31, 1988.

CANADIAN ACTS AND REGULATIONS THAT INCLUDE WHMIS

British Columbia	Workers Compensation Act, Occupational Health and Safety Regulation, 296/97, Part 5, Chemical and Biological Substances
Alberta	Occupational Health and Safety Act, Chemical Hazards Regulation, 393/88 Part 2, Controlled Products
Saskatchewan	Occupational Health and Safety Act Occupational Health and Safety Regulations, 1996, Part XXII, Controlled Products
Manitoba	The Workplace Safety and Health Act Workplace Hazardous Materials Information System Regulation 52/88
Ontario	Occupational Health and Safety Act Workplace Hazardous Materials Information System (WHMIS) Regulation (R.R. O. 1990, Reg. 860)
Quebec	Act Respecting Occupational Health and Safety Regulation respecting Information on Controlled Products, O. C. 445-89
New Brunswick	Occupational Health and Safety Act Workplace Hazardous Materials Information System Regulation 88-221
Nova Scotia	Occupational Health and Safety Act Workplace Hazardous Materials Information System (WHMIS) Regulations (N. S. Reg. 196/88)
Prince Edward Island	Occupational Health and Safety Act Workplace Hazardous Materials Information System Regulations (E.C. 577/88)
Newfoundland	Occupational Health and Safety Act Workplace Hazardous Materials Information System Regulations (C.N.R. 1149/96)
Yukon Territories	Occupational Health and Safety Act Workplace Hazardous Materials Information System Regulations (O.I.C. 1988/107)
Northwest Territories	Safety Act, Work Site Hazardous Materials Information System Regulations (R.R.N.W.T.1990 Chapter S-2)
Canada, Federal	Canada Labour Code Part II Canadian Occupational Health and Safety Regulations, Part X Division III, Controlled Products.

Responsibilities Under WHMIS?

Suppliers, _employers_ and _employees_ all have specified responsibilities in the WHMIS legislation.

Suppliers

Canadian suppliers are those who sell or import products. A supplier must label the product or container, and provide a material safety data sheet (MSDS) to customers.

Employers

Employers are required to establish education and training programs for employees exposed to hazardous products in the workplace. Employers must also make sure that the products are labelled and that current MSDS for each product is readily available to employees.

Employees

Employees are required to participate in the training programs and to apply the safety practices they have learned when working with hazardous materials. They should inform employers when labels have been accidentally removed from containers or are no longer readable.

Governments

WHMIS is enforced by the Labour Branch of Human Resources Development Canada for federal workplaces and by the provincial or territorial ministry responsible for occupational health and safety for most other workplaces.

Health and Safety Committee

The committee assists the employer in the development and implementation of the WHMIS policy and program.

WHMIS Classifications

WHMIS uses a classification system to group chemicals with similar properties or hazards. There are six (6) classes—several of which have divisions or subdivisions.

WHMIS SYMBOLS AND CLASSES

	CLASS A **Compressed Gas**	Contents under high pressure. Cylinder may explode or burst when heated, dropped or damaged.
	CLASS B **Flammable and Combustible Material**	May catch fire when exposed to heat, spark or flame. May burst into flames.
	CLASS C **Oxidizing Material**	May cause fire or explosion when in contact with wood, fuels and other combustible material.
	CLASS D, Division 1 **Poisonous and Infectious Material:** ***immediate and serious toxic effects***	Poisonous substance. A single exposure may be fatal or cause serious or permanent damage to health.
	CLASS D, Division 2 **Poisonous and Infectious Material:** ***other toxic effects***	Poisonous substance. May cause irritation. Repeated exposure may cause cancer, birth defects, or other permanent damage.
	CLASS D, Division 3 **Poisonous and Infectious Material:** ***biohazardous infectious material***	May cause disease or serious illness. Drastic exposures may result in death.
	CLASS E **Corrosive Material**	Can cause burns to eyes, skin or respiratory system.
	CLASS F **Dangerously Reactive Material**	May react violently causing explosion, fire or release of toxic gases, when exposed to light, heat, vibration or extreme temperatures.

Are there any hazardous materials not included in WHMIS?

Yes. There are nine basic categories of materials that are not covered by WHMIS.

- consumer restricted products (products sold to people in regular stores, that are already labelled following the rules of the Hazardous Products Act)
- explosives (as defined by the Explosives Act)
- cosmetics, drugs, food or devices (as defined by the Food and Drug Act)
- pest control products (pesticides, herbicides, insecticides, etc.) as defined by the Pest Control Products Act
- radioactive materials (as defined by the Atomic Energy Control Act)
- wood, and products made of wood
- manufactured articles
- tobacco, or products made of tobacco
- hazardous waste

WHMIS Labeling Requirements

Labels are required by WHMIS laws, and are the responsibility of suppliers, employers and sometimes employees.

A supplier label must:

1. appear on all controlled products received at workplaces in Canada
2. contain the following information:
   - product identifier (name of product)
   - supplier identifier (name of company that sold it)
   - a statement that an MSDS is available
   - hazard classification symbols
   - risk phrases (words that describe the main hazards of the product)

- precautionary measures (how to work with the product safely), and
- first aid measures (what to do in an emergency)

3. have all text in English and French
4. have the WHMIS hatched border

Sample
NETTOYANT XYZ CLEANER
Causes Burns
Very Toxic Material
Avoid Contact with Skin
Cause des brûlures
Produit très toxique
Éviter tout contact avec la peau
In case of skin or eye contact, flush with copious amounts of water for 15 minutes and seek medical attention
En cas de contact avec la peau ou les yeux, laver à grande eau pendant 15 minutes et consulter un médecin.
See Material Safety Data Sheet
Voir la fiche signalétique
ABC Chemical Company Ltd.
Fabricant de produits chimiques ABC

Sample Supplier Label

A Workplace Label

Sometimes, people want to put some of the controlled product into another container for use in the workplace. This new container requires a workplace WHMIS label which must have the following information:

- product identifier (product name)
- information for the safe handling of the product
- statement that the MSDS is available

Material Shipped in Bulk

- The tank or container that the bulk material is transferred into must be labelled with either a supplier label or a workplace label.

- When the material is moved into containers for resale or delivery out of the workplace, there must be a supplier label on each container.
- When the bulk material is used in the workplace and transferred into smaller containers, a workplace label is required on the containers.

Material in Pipes and Reaction Vessels

When the material is in a pipe or reaction vessel, a label might not be necessary. Pipes and reaction vessels may be marked in other ways such as colour coding, or placards. It is the employer's duty to train employees on how to recognize and interpret the markings used in their workplace.

3. Material Safety Data Sheets

The MSDS is prepared by the supplier of the product and contains the following information:

- the potential health effects of exposure to a specific chemical product,
- how to work safely with that product,
- hazard evaluations on the use, storage, and handling,
- personal protective equipment needed, and
- emergency procedures related to the product.

In Canada, every material that is controlled by WHMIS (Workplace Hazardous Materials Information System) must be accompanied by its own MSDS.

The Information on an MSDS

The following nine (9) categories of information must be present on an MSDS in Canada:

1. Product Information: product identifier (name), manufacturer and supplier names, addresses, and emergency phone numbers
2. Hazardous Ingredients
3. Physical Data
4. Fire or Explosion Da
5. Reactivity Data: information on the chemical instability of a product and the substances it may react with
6. Toxicological Properties: health effects
7. Preventive Measures
8. First Aid Measures
9. Preparation Information: who is responsible for preparation and date of preparation of MSDS

The American National Standard recommends a 16-section MSDS.

In Canada, MSDSs in the 16-heading format are acceptable as long as two conditions are met:

1. All the required information specified under Column III of Schedule I of the Controlled Products Regulations (CPR) must be addressed. (All nine categories must be addressed.)
2. The statement "This product has been classified in accordance with the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR" must appear under the section heading *Regulatory Information*.

MSDS Sixteen Heading Format

Section 1.	Product and company identification
Section 2.	Composition/information on ingredients
Section 3.	Hazards identification
Section 4.	First aid measures
Section 5.	Fire fighting measures
Section 6.	Accidental release measures
Section 7.	Handling and storage
Section 8.	Exposure controls/personal protection
Section 9.	Physical and chemical properties
Section 10.	Stability and reactivity
Section 11.	Toxicological information
Section 12.	Ecological information
Section 13.	Disposal considerations
Section 14.	Transport information
Section 15.	Regulatory information
Section 16.	Other information

MSDSs are Time-sensitive

Under WHMIS law, an MSDS for a controlled product must not be more than three years old. If significant new information becomes available before the three years have elapsed, the supplier is required to update the product label and MSDS.

Employer's Responsibilities Regarding MSDS

Employers must make sure that:

- all controlled products entering the workplace have an up-to-date (less than three years old) MSDS.
- the MSDS is readily available to the health and safety committee or representative and to the employees who are exposed to the controlled product.
- an MSDS is available for any controlled product they manufacture.

4. U.S. Occupational Health and Safety Legislation

In the United States of America (USA) the Occupational Safety and Health Act is popularly known as OSHA Act. The Occupational Safety and Health Administration (OSHA) is responsible for administering the OSHA Act.

The OSHA ACT does not cover the following four categories of people:

- self-employed persons
- farms which employ only immediate family members of the farm employer
- workers covered by other legislation
- state and local government employees

Regulations dealing with OSHA are published in Title 29 of the Code of Federal Regulations as:

- 29 CFR Part 1910 Occupational Safety and Health Standards
- 29 CFR Part 1926 Construction Standards

These standards define exposure limits, exposure monitoring methods, medical surveillance and protective measures.

Duties of Employer

The OSHA Act sets out two main duties for employers:

- Employers must provide a workplace which is free from hazards that are known to cause or likely to cause death or serious physical harm to employees.
- Employers must comply with occupational safety and health standards under the Act.

Duties of Employees

Employees must comply with occupational safety and health standards, rules, regulations and orders which are applicable to their own conduct and actions.

Key Provisions

Some Key Provisions of the OSHA Act:

- to assure, insofar as possible, that every employee has safe and healthy working conditions
- to require employers to maintain accurate records of exposures to potentially toxic materials or harmful physical agents and inform employees of the monitoring results
- to allow at least one employee representative to be present during the walkaround inspection
- to encourage free and open exchange of information between employers and the inspector
- to implement procedures for investigating alleged violations, at the request of any employee or employee representatives, issuing citations and assessing monetary penalties against employers

Hazard Communication

The intent of the OSHA Hazard Communication Standard is to provide employees with information and training about the potential health hazards from exposure to workplace chemicals. The Standard requires that employee training include:

- explanations of the requirements of the standard
- identification of workplace operations where hazardous chemicals are present
- knowledge of the methods and observations used to detect the presence of hazardous workplace chemicals
- assessment of the physical and health hazards of those chemicals

- warnings about hazards associated with chemicals in unlabelled pipes
- descriptions of hazards associated with non-routine tasks
- details about the measures employees can take to protect themselves against these hazards, including specific procedures
- explanation of the labeling system
- instructions on location and use of material safety data sheets (MSDSs)
- details on the availability and location of the hazardous materials inventory, MSDSs, and other written hazard communication material

Hazard Warning Symbols

Chemicals produced in the USA come under OSHA Hazard Communication Standard. The label on the container must warn about potential hazards of the product. OSHA does not require hazard symbols on the label, however, the skull and crossbones symbol is acceptable on containers of highly toxic substances, and the flame symbol is acceptable on containers of flammable substances.

Section VIII

Information Sources

1. Canadian Government Departments with Responsibility for Occupational Health and Safety
2. US Federal Safety and Health Agencies
3. State Occupational Safety and Health Plans

1. Canadian Government Departments Responsible for Occupational Health and Safety

Canadian Centre for Occupational Health and Safety (CCOHS)

Client Services
Phone: 905-570-8094
Toll-free: 1-800-668-4284 (Canada and US only)
Fax: 905-572-2206
E-mail: clientservices@ccohs.ca
Web Site: www.ccohs.ca

Inquiries Service
(FREE answers to your OH&S questions)
Phone: 905-572-4400
Toll-free: 1-800-263-8466 (Canada only)
Fax: 905-572-4500
E-mail: inquiries@ccohs.ca
OSH Answers Web Site: www.ccohs.ca/oshanswers

Federal Jurisdiction

Labour Program
Human Resources Development Canada
Ottawa ON K1A 0J2

Regional and District Offices
http://www.hrdc-drhc.gc.ca/menu/profile-search.shtml

Provincial Jurisdictions

Alberta

Workplace Health and Safety
Alberta Human Resources and Employment
9940-106 Street
Edmonton, AB T5K 2N2
Call Centre: 1-866-415-8690
Fax: (780) 422-3730
E-mail: whs@gov.ab.ca
Web Site: www.gov.ab.ca/hre/whs/

British Columbia

Workers' Compensation Board of British Columbia
PO Box 5350 Stn Terminal
Vancouver, BC V6B 5L5
General Inquiries: (604) 273-2266
Toll-free: 1-800-661-2112
Fax: (604) 276-3247

Prevention Information Line
Phone: (604) 276-3100
Toll-free in B.C.: 1-888-621-7233 (SAFE)

Health and Safety Emergency Accident Reporting
Toll-free in B.C.: 1-888-621-7233 (SAFE)
After Hours Phone: 1-866-922-4357
Web Site: www.worksafebc.com

Manitoba

Workplace Safety and Health Division
Manitoba Labour
200-401 York Avenue
Winnipeg, MB R3C 0P8
General Inquiries: (204) 945-3446
Toll-free in Manitoba: 1-800-282-8069
After hours: (204) 945-0581
Fax: (204) 945-4556
Web Site: www.gov.mb.ca/labour/safety/

New Brunswick

Workplace Health, Safety and Compensation Commission of New Brunswick
500 Beaverbrook Court
Fredericton, NB E3B 5X4
General Inquiries: (506) 453-2467
Toll-free in NB: 1-800-442-9776
Fax: (506) 453-7982
Web Site: www.whscc.nb.ca/

Newfoundland and Labrador

Department of Labour
Confederation Building, 4th Floor, West Block
PO Box 8700
St. John's, NF A1B 4J6
General Inquiries: (709) 729-7420
Toll-free in NF: 1-800-563-5471
Fax: (709) 729-3445
Web Site: www.gov.nf.ca/env/labour

Northwest Territories and Nunavut

Workers' Compensation Board of Northwest Territories and Nunavut
PO Box 8888
Yellowknif,e NT X1A 2R3
General Inquiries: (867) 920-3888
Toll-free: 1-800-661-0792
Fax: (867) 873-4596
E-mail: yellowknife@wcb.nt.ca
Web Site: http://www.wcb.nt.ca/home.htm

Nova Scotia

Nova Scotia Department of Environment and Labour
Occupational Health and Safety Division
5151 Terminal Rd., 6th Floor
PO Box 697
Halifax, NS B3J 2T8
General Inquiries: (902) 424-5400
Toll-free in NS: 1-800-952-2687
Fax: (902) 424-3239
E-mail: labrohs@gov.ns.ca
Web Site: http://www.gov.ns.ca/enla/ohs/

Ontario

Ministry of Labour
Occupational Health and Safety Branch
655 Bay St., 14th Floor
Toronto, ON M7A 1T7
General Inquiries: (416) 326-7770
Toll-free in Ontario: 1-800-268-8013
Fax: (416) 326-7761
E-mail: webohs@mol.gov.on.ca
Web Site: www.gov.on.ca/LAB/main.htm

Prince Edward Island

Workers' Compensation Board of PEI
Occupational Health and Safety Division
PO Box 757, 14 Weymouth Street
Charlottetown, PE C1A 7L7
General Inquiries: (902) 368-5680
Toll-free in PEI: 1-800-237-5049
Fax: (902) 368-5705
Web Site: www.wcb.pe.ca

Québec

Commission de la santé et de la sécurité du travail du Québec (CSST) (Occupational Health & Safety Commission)

CP 6056, Succursale Centre-ville
Montréal, PQ H3C 4E1
Phone: (514)) 906-3060
Toll-free in PQ: 1-800-667-7585
Fax: (514)) 906-3062
Web Site: www.csst.qc.ca

Saskatchewan

Saskatchewan Labour
Occupational Health and Safety Division

1870 Albert Street
Regina, SK S4P 3V7
General Inquiries: (306) 787-4496
Toll-free in SK: 1-800-567-7233
Fax: (306) 787-2208
Web Site: www.labour.gov.sk.ca/

Saskatoon Office:
Phone: (306) 933-5042
Toll-free: 1-800-667-5023
Fax: (306) 933-7339

Yukon Territory

Workers' Compensation, Health and Safety Board
Occupational Health and Safety Branch

401 Strickland Street
Whitehorse, YT Y1A 5N8
General Inquiries: (867) 667-5645
Toll-free in the Yukon: 1-800-661-0443
Fax: (867) 393-6279
Web Site: www.wcb.yk.ca

For an up-to-date listing of information sources visit
http://www.ccohs.ca/oshanswers/information/govt.html

2. US Federal Safety and Health Agencies

US Environmental Protection Agency (EPA)

Ariel Rios Building
1200 Pennsylvania Avenue N.W.
Washington, DC 20460
Phone: (202) 260-2090
International Requests Fax: (202) 566-0544
Toll-free: 1-800-424-9346
Web Site: www.epa.gov

National Institute for Occupational Safety and Health (NIOSH)

4676 Columbia Parkway
Cincinnati, OH 45226
Publications Dissemination
Phone: (513) 533-8471
Fax: (573) 533-8573
Toll-free in the US: 1-800-35-NIOSH
(1-800-356-4674)
Outside the US: (513) 533-8328
E-mail: PubstaFt@cdc.gov
Web Site: www.cdc.gov/NIOSH/homepage.html

Occupational Safety & Health Administration (OSHA)

200 Constitution Ave., NW
Washington, DC 20210
Phone: (202) 693-2000
Toll-free: 1-800-321-OSHA (Emergency reporting)
Web Site: www.osha.gov

A listing of the Regional Offices follows:

OSHA Regional Offices

Region 1: Connecticut, Maine, Massachusetts, New Hampshire, Rhode Island, and Vermont, US Dept. of Labor—OSHA

JFK Federal Building, Room E340
Boston, MA 02203
Phone: (617) 565-9860
Fax: (617) 565-9827
Web Site: www.osha.gov/oshdir/r01.html

Region 2: New Jersey, New York, and Puerto Rico, Virgin Islands, USA Dept. of Labor—OSHA

201 Varick St., Rm. 670
New York, NY 10014
Phone: (212) 337-2378
Fax: (212) 337-2371
Web Site: www.osha.gov/oshdir/r02.html

Region 3: District of Columbia, Delaware, Maryland, Pennsylvania, Virginia and West Virginia, USA Dept. of Labor—OSHA

The Curtis Center-Suite 740 West
170 S. Independence Mall West
Philadelphia, PA 19106-3309
Phone: (215) 861-4900
Fax: (215) 861-4904
Web Site: www.osha.gov/oshdir/r03.html

Region 4: Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee, USA Dept. of Labor—OSHA

61 Forsyth St. SW
Atlanta, Georgia 30303
Phone: (404) 562-2300
Fax: (404) 562-2295
Web Site: www.osha.vog/oshdir/r04.html

Region 5: Illinois, Indiana, Michigan, Minnesota, Ohio, and Wisconsin, USA Dept. of Labor—OSHA
230 South Dearborn St., Rm. 3244
Chicago, IL 60604
Phone: (312) 353-2220
Fax: (312) 353-7774
Web Site: www.osha.gov/oshdir/r05.html

Region 6: Arkansas, Louisiana, New Mexico, Oklahoma, and Texas, USA Dept. of Labor—OSHA
525 Griffin St., Rm. 602
Dallas, TX 75202
Phone: (214) 767-4731
Fax: (214) 767-4693
Web Site: www.osha.gov/oshdir/r06.html

Region 7: Iowa, Kansas, Missouri, and Nebraska, USA Dept. of Labor—OSHA
City Center Square
1100 Main St., Suite 800
Kansas City, MO 64105
Phone: (816) 426-5861
Fax: (816) 426-2750
Web Site: www.osha.gov/oshdir/r07.html

Region 8: Colorado, Montana, North Dakota, South Dakota, Utah, and Wyoming, USA Dept. of Labor—OSHA
1999 Broadway, Suite 1690
Denver, CO 80202-6550
Phone: (303) 844-1600
Fax: (303) 844-1616
Web Site: www.osha.gov/oshdir/r08.html

Region 9: Samoa, Arizona, California, Guam, Hawaii, Nevada, and Trust Territory of the Pacific Islands, USA Dept. of Labor—OSHA

71 Stevenson Street St.
4th Floor, Suite 420
San Francisco, CA 94105
Phone: (415) 975-4310
Fax: (415) 975-4319
Web Site: www.osha.gov/oshdir/r09.html

Region 10: Alaska, Idaho, Oregon, Washington, USA Dept. of Labor—OSHA

1111 Third Avenue, Suite 71
Seattle, Washington 98101-3212
Phone: (206) 553-5930
Fax: (206) 553-6499
Web Site: www.osha.gov/oshdir/r10.html

3. State Occupational Safety and Health Plans

Alaska

Alaska Department of Labor
P.O. Box 21149
Juneau, Alaska 99801-1149
Physical location
1111 W. 8th Street, Room 304
Juneau, Alaska 99801-1149
Web Site: www.labor.state.ak.us/lss/lss.htm

Arizona

Industrial Commission of Arizona
800 W. Washington
Phoenix, Arizona 85007-2922
Telephone: (602) 542-4411
(602) 542-5795
Fax: (602) 542-1614
Web Site: http://www.ica.state.az.us/ADOSH/oshatop.htm

California

California Department of Industrial Relations
455 Golden Gate Avenue - 10th Floor
San Francisco, California 94102
Telephone: (415) 703-5050
Fax: (415) 703-5114
Web Site: http://www.dir.ca.gov/occupational_safety.html

Connecticut

Connecticut Department of Labor
Consultation Services
Division of Occupational Safety and Health
38 Wolcott Hill Road
Wethersfield, Connecticut 06109
Telephone: (860) 566-4550
Fax: (860) 566-6916
Web Site: http://www.ctdol.state.ct.us/osha/osha.htm

Hawaii

Hawaii Department of Labor and Industrial Relations
Consultation and Training Branch
830 Punchbowl Street
Honolulu, Hawaii 96813
Phone: (808) 586-9100
Fax: (808) 586-9104
Web Site: http://www.state.hi.us/dlir/hiosh/

Indiana

Indiana Department of Labor
Bureau of Safety, Education and Training
Division of Labor, Room W195
402 West Washington
Indianapolis, Indiana 46204-2287
Phone: (317) 232-2688
Fax: (317) 232-3790
Web Site: http://www.state.in.us/labor/iosha/iosha.html

Iowa

Iowa Division of Labor Services
Consultation Program
1000 E. Grand Avenue
Des Moines, Iowa 50319-0209
Phone: (515) 281-7629 Consultation
Phone: (515) 281-0202 Education
Fax: (515) 281-5522
Web Site: http://www.state.ia.us/iwd/labor/ index.html

Kentucky

Kentucky Labor Cabinet
1047 U.S. Highway 127 South, Suite 4
Frankfort, Kentucky 40601
Phone: (502) 564-3070 ext. 305
Fax: (502) 564-4769

OSH Division of Education and Training
Phone: (502) 564-3070 ext. 266
Fax: (502) 564-4769 FAX
Web Site: http://www.kylabor.net/kyosh/index.htm

Maryland

Maryland Department of Labor, Licensing and Regulation
1100 North Eutaw Street, Room 613
Baltimore, Maryland 21201-2206
Maryland Occupational Safety & Health (MOSH)
Phone: (410) 767-2215
Fax: (410) 333-7747
Web Site: http://www.dllr.state.md.us/labor/mosh.html

Michigan

Michigan Department of Consumer and Industry Services, Bureau of Safety and Regulation
7150 Harris Drive
P.O. Box 30643
Lansing, Michigan 48909-8143
Phone: (517) 322-1814
Fax: (517) 322-1775
Web Site: http://www.cis.state.mi.us/bsr/

Minnesota

Minnesota Department of Labor and Industry
443 Lafayette Road North
St. Paul, Minnesota 55155-4307
Telephone: (651) 284-5050
Fax: (651) 297-1953
Internet: http://www.doli.state.mn.us/wsc.html

Nevada

Nevada Division of Industrial Relations Occupational Safety and Health Enforcement Section (OSHES)
1301 N. Green Valley Parkway – Suite 200
Henderson, Nevada 89014
Safety Consultation and Training Section
Phone: 702-486-9140
Fax: 702-990-0362
Web Site: http://dirweb.state.nv.us

New Jersey

New Jersey Department of Labor
Division of Public Safety and Occupational
Safety and Health
225 E. State Street
8th Floor West
P.O. Box 953
Trenton, New Jersey 08625-0953
Phone: (609) 292-3923
Fax: (609) 292-4409
Consultation Web Page: http://www.state.nj.us/labor/wps/psosh/onsite/onsite.htm
New Jersey State OSH Plan Web Page:
http://www.state.nj.us/labor/isse/ispcosh.html

New Mexico

New Mexico Environment Department
Occupational Health and Safety Bureau
525 Camino de Los Marquez, Suite 3
PO Box 26110
Santa Fe, New Mexico 87502
Phone: (505) 827-4230
Fax: (505) 827-4422
Web Site: www.nmenv.state.nm.us/OHSBwebsite/ohsb-home-htm

New York

New York Department of Labor
W. Averell Harriman State Office Building–12
Room 500
Albany, New York 12240
New York On-Site Consultation Program
State Office Campus Building 12, Room 168
Albany, New York 12240
Phone: (518) 457-2238
Fax: (518) 457-3454
Web site: http://www.labor.state.ny.us/working_ny/worker_rights/safety_health.html?

North Carolina

North Carolina Department of Labor (NCDOL)
4 West Edenton Street
Raleigh, North Carolina 27601-1092
Bureau of Consultative Services
Phone: (919) 807-2899
Fax: (919) 807-2902
Web site: http://www.nclabor.com/osha/osh.htm

Oregon

Oregon Occupational Safety and Health Division
Department of Consumer & Business Services
350 Winter Street, NE, Room 430
Salem, Oregon 97310
Phone: (503) 378-3272
Toll-free in Oregon: (800) 922-2689
Web site: http://www.orosha.org/

Puerto Rico

Puerto Rico Department of Labor and Human Resources, Occupational Safety and Health Office
Department of Labor and Human Resources
20th Floor
505 Muñoz Rivera Avenue
Hato Rey, Puerto Rico 00918
Phone: (787) 756-1100, 1106
Fax: (787) 767-6051
Web site: http://dtrh.prstar.net/

South Carolina

South Carolina Department of Labor, Licensing and Regulation, Office of OSHA Compliance
3600 Forest Drive
PO Box 11329
Columbia, South Carolina 29204
Telephone: (803) 734-9644
Fax: (803) 734-9772
Web site : http://www.llr.state.sc.us/osha.asp

Tennesse

Tennessee Department of Labor and Workforce Development, OSHA Consultative Services

Tennessee Department of Labor and Workforce Development
710 James Robertson Parkway, 3rd Floor
Nashville, Tennessee 37243-0659
Phone: (615) 741-7036
Fax: (615) 532-2997
Web site : http://www.state.tn.us/labor-wfd

Utah

Utah Labor Commission
Consultation Services

160 East 300 South, 3rd Floor
Salt Lake City, Utah 84114-6650
Phone: (801) 530-6901
Fax: (801) 530-6992
Web site : http://www.labor.state.ut.us/Utah_Occupational_Safety__Hea/utah_occupational_safety__hea.htm

Vermont

Vermont Department of Labor and Industry
Division of Occupational Safety & Health

National Life Building, Drawer 20
National Life Drive
Montpelier, Vermont 05602-3401
Phone: (802) 828-2765
Fax: (802) 828-2748
Web site : http://www.state.vt.us/labind/vosha.htm

Virginia

Virginia Department of Labor and Industry
Powers-Taylor Building
13 South 13th Street
Richmond, Virginia 23219
Telephone: (804) 786-2377
Fax: (804) 371-6524
Web site: http://doli.state.va.us/

Virgin Islands

Virgin Islands Department of Labor
Division of Occupational Safety and Health
3021 Golden Rock
Christiansted, St. Croix, Virgin Island 00840
Phone: (340) 772-1315
Fax: (340) 772-4323

Washington

Washington Department of Labor and Industries
PO Box 44001
Olympia, Washington 98504-4001
Phone : (360) 902-4200
Fax: (360) 902-4202
Web site: http://www.lni.wa.gov/wisha/default.htm

Wyoming

Wyoming Department of Employment
Workers' Safety and Compensation Division
Cheyenne Business Center
1510 East Pershing Blvd.
Cheyenne, Wyoming 82002
Phone: (307) 777-7786
Fax: (307) 777-3646
Web site: http://wydoe.state.wy.us/doe.asp?ID=7

Appendices

A1. Occupational Health and Safety Program Checklist

A2. Selecting a Consultant

A3. Abbreviations

A1. OSH Program Checklist

Sample

OH&S PROGRAM CHECKLIST

	OK	NOT OK	Recommended Action
COMPANY SAFETY POLICY			
- Written, communicated, posted, reviewed			
- Understood by everyone			
- Specifies responsibility			
- Establishes accountability			
- Sets Company goals			
MANAGEMENT LEADERSHIP			
- Budget			
- Information			
- Personnel			
- Expertise			
- Means to hold employees accountable			
- Periodic program review			
HEALTH AND SAFETY LEGISLATION			
A. Line Managers/Supervisors			
- Trained in OH&S			
- Understand their duties			
- Held accountable for OH&S			
B. Employees			
- Trained in safe work practice			
- Understand their duties			
- Aware of their rights			
- Report unsafe conditions and practices			
- Participate in the development of OH&S program and safe work practices			

	OK	NOT OK	Recommended Action
WORKPLACE HAZARDOUS MATERIAL INFORMATION SYSTEM			
- MSDSs readily available			
- Product labels on all containers			
- Workplace WHMIS labels			
- Employee training, understanding			
JOB SAFETY ANALYSIS (JSA)			
- Written procedures			
- Defined responsibility			
- Used to develop safe work practices			
- Routine job hazard analysis done			
JOINT SAFETY AND HEALTH COMMITTEE			
- Terms of reference established			
- Training provided			
- Regular meetings			
- Minutes posted			
- Recommendations followed up			
WORKPLACE INSPECTIONS			
- Inspection team established			
- Regular inspections done			
- Checklist for inspection established			
- Reports presented in committee meeting			
- Action taken on recommendations			
HAZARD REPORTING			
- Reporting system and format established			
- Responsibility for follow-up assigned			
- Management responds to hazard reports			

	OK	NOT OK	Recommended Action
INCIDENTS AND ACCIDENTS REPORTING			
- All employees understand purpose of investigations			
- All incidents and accidents reported			
- Established procedure understood by all			
- Clearly defined responsibility for investigation			
INVESTIGATION AND FOLLOW-UP			
- written investigation procedure			
- Trained company investigators/supervisors			
- Clearly defined reporting procedures			
- Responsibility for corrective action defined			
- Results of investigation and corrective actions communicated to all employees			
- Safe way of doing is the right way: understood by everyone			
- Written safe working procedures:			
Communicated			
Understood			
Followed			
Feed-back provided			
ACCIDENT AND INJURY RECORDS			
- All cases of injury and illness documented			
- Injury and illness data annually reviewed			
- Long-term and short-term prevention goals			
- Preventive measures implemented			

	OK	NOT OK	Recommended Action
PERSONAL PROTECTIVE EQUIPMENT			
- Written procedure established			
- Equipment made available as required			
- Use, maintenance, replacement training			
EMERGENCY PROCEDURES			
- All potential emergencies identified			
- Trained emergency response team on site			
- Written procedures communicated			
- Responsibility assigned			
- Evacuation procedure established			
- Responsibility for all clear signal known			
FIRST AID			
- First aid facilities clearly indicated			
- Responsibility for first aid box assigned			
- Trained first aid givers available			
- First aid register maintained			
- Procedure for seeking medical aid established, communicated and understood by everyone			
TRAINING NEW AND TRANSFERRED EMPLOYEES			
- OH&S part of orientation employee			
- Safety part of the orientation package			

	OK	NOT OK	Recommended Action
On-the-job training:			
- Responsibility for training needs assigned			
- Knowledgeable persons conduct training			
- Training focus on workplace specific needs			
- Periodic training provided and updated			
COMMUNICATION			
- Planned safety meetings			
- Safety on management meeting agenda			
- Seminars, newsletters, promotion			
- OH&S criteria in buying new equipment			
WORKPLACE MONITORING			
- Defined responsibility for monitoring			
- Chemical, physical and biological hazards			
- Established procedures for needs analysis			
- Resources provided - Records communicated and maintained			
WCB CLAIMS MANAGEMENT PROGRAM			
- Responsibility assigned			
- Progress of injured workers monitored			

A2. Selecting a Consultant

You may need the services of a consultant when the preliminary investigation reveals that a detailed investigation is necessary. It is the client's responsibility to find a competent consultant who is qualified by education, knowledge and experience.

Sample

CONSULTANT'S QUALIFICATION CHECKLIST

CONSULTANT'S NAME _____

EMPLOYER _____

_____

1. EDUCATION (Industrial Hygiene, Engineering, Related Discipline)

   _____

2. CERTIFICATION and REGISTRATION (Canadian Registration Board of Occupational Hygienists, American Board of Industrial Hygiene, Professional Engineers Associations)

   _____

   _____

3. CURRENT AWARENESS (recent publications, attendance at seminars, symposia, courses, etc.)

   _____

   _____

4. YEARS OF EXPERIENCE _____

5. PREVIOUS CLIENTS *(that can be contacted for reference)*

   _____

6. MONITORING EQUIPMENT (Sales agent, supplier or manufacturer)

   _____

7. **EQUIPMENT USED** **DATE OF CALIBRATION**

_____ _____

_____ _____

_____ _____

8. **LABORATORIES USED FOR ANALYSIS OF SAMPLES**

Accredited AIHA laboratory? ❑ **YES** ❑ **NO**

Other(s) _____

9. **DEFINE THE WORK TO BE DONE** (List services to be provided)

_____

_____

_____

10. **DELIVERABLES** (Describe content and organization of the report)

_____

_____

11. **ESTIMATED COST OF SERVICE** _____

12. **WILL CONSULTANT TESTIFY IN CASE OF LITIGATION?**

❑ **YES** ❑ **NO**

13. **EXAMPLES OF PREVIOUS REPORTS**

_____

_____

14. **EXPECTED DATE OF COMPLETION** _____

Addresses/Telephone Numbers of Consultants

The following organizations maintain a listing of persons and companies specializing in indoor air quality investigation:

1. **Canadian Centre for Occupational Health and Safety**
   Resources database on CD-ROM.
   Hamilton, Canada.
   Phone 1-800-263-8466
   E-mail: custserv@ccohs.ca
   Web site: http://www.ccohs.ca
   Fax: (905) 572-2206

2. **Provincial Professional Engineers Associations**
   Consult your local telephone directory.
   For example in Ontario Call 1-800-339-3716

3. **American Conference of Governmental Industrial Hygienists (ACGIH)**
   Cincinnati, Ohio, USA
   Phone (513) 742-2020
   E-mail: tech@acgih.org
   Fax: (513) 74 2-3355

4. **American Industrial Hygiene Association (AIHA)**
   Fairfax, Virginia, USA
   Telephone (703) 849-8888
   E-mail: infonet@aiha.org
   Fax: (703) 207-3561

5. **US Environmental Protection Agency (EPA), Indoor Air Division**
   Washington D.C.
   Telephone: (202) 260-2080
   Web site: http://www.epa.gov/iaq/index.html

A3. Abbreviations

ACGIH

American Conference of Governmental Industrial Hygienists. ACGIH is a professional society of government workers and educators who work to promote occupational safety and health. The organization publishes recommendations on ventilation, air sampling and airborne chemical concentration guideline (threshold limit values or TLVS) designed to limit and control exposure of workers to airborne chemicals in the workplace.

ANSI

American National Standards Institute; an American organization that produces the ANSI standards.

ASHRAE

American Society of Heating, Refrigeration and Air Conditioning Engineers— sets ventilation and other standards related to the indoor environment.

CCOHS

Canadian Centre for Occupational Health and Safety, Canada's national organization for promotion of workplace health and safety by providing information, advice, and training.

CGSB

Canadian General Standards Board.

CSA

Canadian National Standards Association, a national organization that produces CSA standards.

EPA

U.S. Environmental Protection Agency.

IAPA

Industrial Accident Prevention Association, Ontario

IARC

International Agency for Research on Cancer. IARC, part of the World Health Organization, is an international organization that evaluates the human cancer risk from chemical exposure.

ISO

International Organization for Standardization, an international organization that produces the ISO standards.

MSDS

Material Safety Data Sheet—provides information about toxicity and safe work practices for chemicals

NFPA

National Fire Protection Association (USA). Publishes the Fire Code.

NIOSH

U.S. National Institute for Occupational Safety and Health. NIOSH, part of the Center for Disease Control, conducts research on worker safety and health and recommends standards for worker protection to OSHA.

OSHA

U.S. Occupational Safety and Health Administration, develops and enforces health and safety legislation

PPE

Personal protective equipment: hard hat, ear plugs, safety boots, gloves, etc

TLV

Threshold Limit Values recommended by ACGIH—often used as guidelines to set occupational exposure limits

UV

Ultraviolet radiation—invisible radiation emission from the welding arcs

WCB

Workers' Compensation Board

WSIB

Workplace Safety and Insurance Board (Ontario)

Notes

Notes

Notes

electronic

Other Products by CCOHS

A 30-Day FREE Trial is available for any CD-ROM product

A collection of chemical information including:

MSDS and **FTSS** *(160,000 Material Safety Data Sheets)*
CHEMpendium™
RTECS®
NIOSH Manual of Analytical Methods
NIOSH Pocket Guide
IPCS INTOX

References to oh&s books, journals, articles and reports

OSHLINE with NIOSHTIC®
OSH References [CISILO (English/French), HSELINE, Canadiana, OSHLINE™ with NIOSHTIC®, INRS Bibliographic]
OSH Researcher
TOXLINE®

Regulatory Information

Canadian enviroOSH Legislation Complete text, including graphics, of health, safety and environmental acts and regulations from all jurisdictions. Available as a national or regional collection including – National, Ontario, Eastern Canada, or Western Canada.

Canadian enviroOSH Legislation *plus* Standards
National collection of Canadian H&S Legislation *plus* the complete text of standards referenced in the legislation.

HRDC Labour Branch A collection of publications and databases from the federal jurisdiction

Publications in this series

Groundskeepers Safety Guide for groundskeepers, landscape contractors and nursery workers.

Cold Weather Workers Safety Guide addresses the health and safety information needs of the outdoor worker.

School Workers Health and Safety Guide for teachers, custodians, school administrators and school board officials.

Office Ergonomics Safety Guide helps office workers to recognize ergonomic hazards and take remedial action.

Food Service Workers Safety Guide covering all safety aspects of the food preparation and service industries.

Warehouse Workers Safety Guide for workers in warehouses, storage facilities, bulk stores and the transport industry.

Indoor Air Quality Health and Safety Guide addresses concerns about indoor air quality, and explains everything building occupants need to know about ensuring their health and comfort.

Violence in the Workplace Prevention Guide an essential resource for anyone who wants to learn about workplace violence and its prevention.

Welders Health and Safety Guide helps workers recognize hazards associated with welding work and to prevent injury and illness.

Noise Control in Industry: A Basic Guide helps workers and employers recognize noise problems, take steps to control occupational noise exposure and develop a hearing conservation program.

Wellness in the Workplace provides practical steps and program suggestions for workplace health and wellness programs. Create a wellness program or integrate one or more initiatives into your existing framework.

Health and Safety Guide for Libraries helps you recognize, evaluate and control workplace hazards in libraries and other information centres.

For more information about these titles

905-570-8094 or **1-800-668-4284**

Fax: 905-572-2206 E-mail: clientservices@ccohs.ca

Web Site: www.ccohs.ca

Canada's national centre for occupational health and safety. We provide unbiased information, advice and training on how to prevent illness and injury in the workplace.

When you have a question about health or safety, remember to use these FREE services:

1-800-263-8466
905-572-4400
inquiries@ccohs.ca

www.ccohs.ca/oshanswers

For more information about CCOHS products and services:

905-570-8094 or 1-800-668-4284
Fax: 905-572-2206 -E-mail: clientservices@ccohs.ca
Web Site: www.ccohs.ca

Hamilton Ontario Canada